Volume 94 Number 21

STEEL

Production . Processing . Distribution . Use

The Week in Perspective

THERE is something strange and unreal in this threat of a steel strike. Like Will Rogers, all that iron and steel executives know about it is what they read in the papers. On Monday, committees from Amalgamated lodges are scheduled to troop into mill offices, demand recognition and perhaps also a 30-hour week and a $6 daily minimum wage, and put the mills on notice of a strike between June 10 and 20. Experienced executives know that strikes must be launched in a flash of anger and that a long time fuse usually sputters out, nevertheless they are not blind to possible dangers.

Amalgamated's Only Hope Is Rule of Confusion by Small Minority

For one thing, a bare handful of men in a mill can intimidate loyal workers and cause trouble. For another, the industry has learned little about courting public opinion, and has forgotten how the Interchurch World movement espoused the cause of William Z. Foster in the 1919 steel strike. The industry, however, gets this "break": Amalgamated lodges in Pennsylvania are not so cocky since last Tuesday's defeat of Governor Pinchot, whose wife urged steel workers to rise against their overlords. The report that the phlegmatic Finns and Swedes in the upper lake ore territory are stirring is less disturbing when it is remembered that 26½ million tons of ore are in reserve.

Only Thin Line of Andrew Carnegie's "Boys" Left as Corey Passes

It took many a veteran of the steel industry back thirty or forty years, back to the time when steel was a rough but lusty infant, to read last week of the passing of William E. Corey. One of Andrew Carnegie's "boys," he attained the presidency of the United States Steel Corp. when only 37. There were giants in the days when Corey was growing up with the industry—Alva Dinkey, Charles M. Schwab, George W. Perkins, James Gayley, E. J. Buffington, William B. Schiller, W. J. Filbert, W. P. Palmer, John W. Gates, August Ziesing, B. F. Jones, Judge E. H. Gary, D. M. Clemson, Powell Stackhouse, E. C. Felton, John Fritz, William B. Leeds and Daniel G. Reid—of whom only a few survive. Last week another link with the past also died—Cass Gilbert, whose 60-story, 792-foot Woolworth building completed in 1912 was called "Gilbert's architectural lark." Today five other New York buildings are taller—and are follies of vacant space.

Ford Steel "Shoppe" Goes Modern; Mill Housings To Be Tinted, Nuts Plated

Operating men get a great kick out of visiting the Ford steel mill. The liberal use of white paint, a profusion of polished brass, and workmen constantly picking up crop ends—well, to a man pinned down to a budget it's incomprehensible. But get this about the new Ford strip mill: All nuts will be chromium plated and roll housings will be painted to resemble mahogany! Incidentally, at the Chicago fair Ford is going to operate a model strip mill, 1/25th scale, rolling miniature sheets and strip out of lead. Those automobile executives who raised car prices some weeks ago now wish they hadn't. Their production is tapering fast, while Ford, who stood pat, is holding up.

Mahomet Finally Goes to the Mountain As Steel Is Designed for the Job

Considering that it was bred in an atmosphere of tonnage and has always associated weight with strength, it is no wonder that the present generation of steelmakers finds it hard to break with the past. But competition is a mighty spur, a foe of complacency, and steel is now being designed for the job instead of the job for steel. Responding to the demand of the carbuilding industry for light-weight construction, the United States Steel Corp. is offering two new high-tensile steels—USS Cor-Ten and USS Man-Ten—with laboratories of other producers also busy.

Equally revolutionary in its field is a Swedish ring-type cold strip mill for rolling stainless steel in thin gages, being marketed by an eastern manufacturer. This unique mill operates like a roller bearing, the central baby roll being the shaft, the two supporting rolls being the roller bearings and two large alloy rings functioning like the outer races.

Amalgamated at Zero Hour in Campaign for Recognition

FORMAL demands were to be presented Monday, May 21, to principal iron and steel producers by lodges of the Amalgamated Association of Iron, Steel and Tin Workers. The minimum demand was to be recognition; unconfirmed rumors added a $6 daily minimum wage, a 5-day week and 6-hour day.

Originally, it was the sense of the Amalgamated convention in Pittsburgh, which adjourned last month, that producers were to be given until June 20 to respond. It was variously reported last week that the deadline had been moved back first to June 17 and then to June 10.

Apparently no immediate reply is to be exacted from the industry. Obviously, executives are not discussing the situation prior to the receipt of the Amalgamated's demand, but unofficially it was said that a majority of the producers would stand for the open shop.

Strength Unknown Quantity

There has been no recent test of Amalgamated strength. While lodges have been organized in practically every iron and steel plant, it is estimated that not more than 10 per cent of employes are members. Primarily, the Amalgamated is a bar iron and sheet mill union and many of the smaller plants are reported to be well-organized.

Unofficially, some executives are looking for trouble chiefly because small groups can picket and intimidate loyal workmen and thus cause trouble and shutdowns. Since the iron and steel industry is rapidly approaching the usual mid-summer lull, less apprehension is expressed than would be expected.

A point that may cause trouble if adhered to is the Amalgamated reported intention of permitting no lodge to sign an agreement for recognition until all lodges have been assured of recognition.

The position of the larger producers of iron and steel who have well-formulated employe representation plans is much happier than that of small units entirly lacking in internal organization.

Threat of a strike at upper Lake Superior iron ore mines existed last week only in newspapers, although the International Union of Mine, Mill and Smelter Workers has been active. Iron ore interests the past several winters have maintained operations far above requirements in order to spread employment, and expect to receive a measure of loyalty in return.

No Dearth of Supplies

So far as supplies of Lake Superior iron ore are concerned, they are far above normal and may prove a deterrent to a strike. At lower lake ports and furnaces, stocks May 1 were 26,580,822 tons, compared with a 10-year normal of 20,000,000 tons. Above ground in the upper lake region are fully 10,000,000 to 15,000,000 tons, or nearly twice the normal reserves. In April, Lake Superior ore was consumed at the rate of 2,500,000 tons a month.

Incidentally, a hearing on the proposed Lake Superior iron ore industry code is scheduled for May 22 in Washington. The industry has been operating under the general provisions of the steel code with the base wage 40 cents an hour, which was increased 10 per cent April 1.

Iron ore miners in Alabama continue on strike.

STATION S-T-E-E-L: When Walter S. Tower, executive secretary of the American Iron and Steel institute, went on the air May 5 he not only emphasized the benefits of the NRA steel code but stressed the dual responsibility of management, first, to maintain satisfactory wages and a broad spread of employment, and, second, to secure fair dividends for stockholders

Steel Code

NRA ADMINISTRATOR JOHNSON said at Washington Friday that conferences last week with steel executives had ironed out all but one point involved in extension of the steel code beyond May 31. Last week's conferences got along "exceedingly well" according to General Johnson. A definite announcement concerning the steel code is expected this week.

Moot questions, before the conferences started, included recognition of water freight rates, the addition of a few more basing points—perhaps Johnstown, Pa.; Youngstown, O.; Duluth; Middletown, O.; etc.—and some adjustment of the waiting time following the filing of prices.

At last week's code conferences were W. A. Irvin, president, United States Steel Corp.; E. G. Grace, president, Bethlehem Steel Corp.; Tom Girdler, chairman, Republic Steel Corp.; L. E. Block, chairman, Inland Steel Co.; E. T. Weir, chairman, National Steel Corp.; and Walter S. Tower and S. A. Moore for the American Iron and Steel institute.

¶American Iron and Steel institute commercial resolution No. 44, as amended May 10 to become effective May 17, allows steel sellers to give to the government the difference between regular published railroad freight rates on steel and the special rates which the railroads allow to the government on many hauls, in return for land grants or other considerations. That is, the steel sellers allow the regular published tariff rate and let the government pay the special rate and pocket the difference. Further, by this resolution, the steel sellers may allow the government the greatest of the differences between shipping points and the point of destination.

¶"Monopolistic conditions have long existed in the iron and steel industry due to its absolute control by the larger companies, this control being assured through the American Iron and Steel institute, which is supposed to represent both large and small enterprises but wherein as a matter of fact the voting arrangements really leave the small enterprise at the mercy of the large."

This is the charge made by Clarence Darrow and majority members of the recovery review board of NRA in a caustic report submitted several weeks ago to the President but withheld until a reply could be made

by NRA Administrator Johnson and the federal trade commission. John F. Sinclair, a member of the board, resigned recently in protest against the majority's stand. A recommendation that the code be amended is made by the Darrow report, with voluminous suggestions.

The reply to this report by General Johnson was made by R. W. Shannon, assistant deputy administrator. A summary by Donald R. Richberg, NRA chief counsel, ascribes the attack upon the codes—other than steel being under fire—as being based largely upon the recent report of the trade commission.

¶Commercial resolution No. 59, effective May 17, allows members of the steel code to sell steel fence posts in less than carload quantities at the carload price.

Financial

SINCE STEEL reported (May 14, pp. 12) that Follansbee Bros. Co. Inc., Pittsburgh, had been placed in receivership, Judge R. M. Gibson, in United States district court at Pittsburgh, appointed John Follansbee, president of the company, and George T. Ladd, president of United Engineering & Foundry Co., Pittsburgh, receivers. Their bond was filed at $50,000. Later last week a third receiver, Attorney B. J. Watson of Columbus, O., was named in an ancillary capacity.

Receivership proceedings were initiated by William J. Kirk, a stockholder of California, and Aetna-Standard Engineering Co., Youngstown, O., an auditor, in behalf of themselves and others. The Follansbee company, a steelmaker for 122 years, has been noted for its production of sheets and tin plate, but recently has been unable to meet current obligations. The company's 1933 pamphlet report disclosed bank loans of $550,000, which had not appeared at the close of 1932.

¶J. Frank Drake, J. B. Doan, J. H. Frantz, Charles R. Hook, W. S. Horner, J. M. Hutton, F. H. Simpson, Paul Sturtevant, Calvin Verity, and George M. Verity were re-elected directors of the American Rolling Mill Co., Middletown, O., at a meeting of stockholders held in the company's offices May 17.

Mr. Hook, president, in analyzing the company's business position with respect to sales and finance, reported that during the first quarter the company had earned $545,269, with operations averaging 65 per cent. Production is continuing at approximately the same rate.

Several new developments which may represent expanded markets for iron and steel sheets, such as metal houses, porcelain enamel pressed metal plumbing ware, and stainless steel sheets, were explained or displayed to the stockholders.

¶International Nickel Co. of Canada Ltd., New York, reports net profit of $5,049,275 in the first quarter, compared with a net profit of $4,026,564 in the last quarter of 1933 and net loss of $80,158 in the first quarter of 1933. Says Robert C. Stanley, president: "As modern industry moves away from the simple metals toward alloys to meet the more exacting standards of performance, the unique position of nickel as an alloying element is an important factor in the development of still wider and more diversified markets."

NRA

CODE for the manganese industry, establishing a 40-hour work-week and 40 cents per hour above ground and 47½ cents below ground in the northwest, 40 and 45 cents in the North and 30 and 35 cents in the South, became effective May 21.

Last week the federal bureau of mines announced 1933 domestic shipments of manganese ore as 18,558 long tons valued at $452,173, compared with 17,777 tons valued at $377,222 in 1932. Imports in 1933 totaled 156,835 tons, containing 79,391 tons of manganese.

¶Other codes approved: Drapery and carpet hardware, effective May 19; wire machinery and wood screw manufacturing, May 20; drop forge industry, May 21; steel package manufacturing, May 26.

¶Code hearings set: Warm air furnace and metal tank industries, May 24; final date for objections to proposed modification of the buff and polishing wheel industry code, May 23; final date for modifying by-laws of the locomotive institute, June 14.

Transportation

JONES & LAUGHLIN STEEL CORP., Pittsburgh, pioneer in river shipment of steel, in October expects to send out its 200th tow of steel products from its Aliquippa, Pa., plant. It was in October, 1921, that Jones & Laughlin first sent steel products down the Ohio, this "steel argosy" being hailed as the dawn of a new day on the Ohio and Mississippi rivers—which it was.

Amid much celebration a few months ago Carnegie Steel Co. dispatched its 100th tow of steel products down the Ohio. On Jan. 25 the I. LAMONT HUGHES left Pittsburgh on voyage No. 100, 2000 miles down the Monongahela, Ohio and Mississippi rivers to New Orleans, towing about 11,000 tons of steel. By coincidence the tow left on the birthday of Carnegie Steel Co.'s president, I. Lamont Hughes.

¶A hearing schedule for Buffalo last Friday on a proposal to add steel sheets to the list of iron and steel articles on which fabrication-in-transit privileges would apply in central freight trunk line and New England Freight association territories was canceled.

¶Freight rate on pig iron from Harbor Junction Wharf in South Provi-

NOW CONVEYING HOLY LAND OIL: This shows a section of the Iraq pipe line being tack welded with the shielded arc after the pipe was lined up prior to finish welding. Connecting the Iraq oil field with the ports of Tripoli in Syria and Haufa in Palestine, the 1200-mile line is a British, French, Dutch and American venture. There were four expert welding crews, composed principally of Americans and a small number of British, French and native operators. Equipment used in the construction of the line was supplied principally by American manufacturers. Welding machines and all of the electrodes used were made by the Lincoln Electric Co., Cleveland

dence, R. I., to Reading, Mass., has been reduced from $2.80 to $2.65. The same New England freight association docket has reduced the Gardner, Mass., rate from $2.80 to $2.65 and to Holyoke, Mass., the new rate is $2.85, a reduction of 35 cents.

Contests

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, 200 Madison avenue, New York, will receive until June 1 photographs of bridges entered for awards for the three most beautiful bridges built during the past year. Stainless steel placques will be awarded the most beautiful monumental bridge, the bridge of medium size and the small span bridge.

New Capacity

ROTARY ELECTRIC STEEL CO. (Michigan), Detroit, which a year ago completed a plant for centrifugal casting of steel following its production in an electric furnace, last week decided to proceed with a cold strip mill capable of rolling 2000 tons monthly up to 12-inch widths. The new mill, awarded to E. W. Bliss Co., Salem, O., is to be completed by August.

Announcement of this third cold strip mill in Detroit (others being Bopp Steel Corp. and Detroit Steel Corp.) follows last week's order of the McClouth Steel Corp. for a hot strip mill to be built in the old Federal Steel Corp. warehouse in Detroit.

¶Ford Motor Co. has ordered from the United Engineering & Foundry Co., Pittsburgh, a model of the sheet-strip mill to be built by the United company for the Ford steelworks at Dearborn, Mich. This model is to cost $25,000, be 50 feet long, be completely equipped with flying shears, motors, rolls, etc., and will roll miniature sheet bars and sheets of lead at the Ford exhibit at the Chicago fair.

Labor

A PROGRAM for handling industrial disputes has been formulated by a special committee of the National Association of Manufacturers, on which Charles R. Hook, president, American Rolling Mill Co., Middletown, O., was a representative for iron and steel.

The plan would set up industrial relations committees within each industry, these being appellate bodies composed of equal representatives of employes and employers, with workers' representation based upon membership of each organization claiming to speak for employes. Over this board would preside an impartial chairman selected by both parties.

Arbitration is provided by the appointment of two representatives, one for each of the parties, with a third chosen by the recovery administrator or by the President in case of national interest.

¶It appeared last week that only pressure from the White House would break the deadlock on the proposed revision of the Wagner labor board bill. With adjournment of congress probably not more than a month distant, chances for the bill's enactment, even in a modified form, appear diminished. The ban on company unions has been stricken out, but rigid restrictions to prevent employer control have been substituted. If the President pushes the bill it will be chiefly because he resents every major labor dispute being dumped on Washington.

¶National labor board has canceled a citation for the Great Lakes Steel Corp., Ecorse, Mich., subsidiary of the National Steel Corp., the company having adjusted a dispute over reinstatement of employes involved in union activities.

¶Chicago safety council awarded placques to industrial plant winners in its safety contest, following the twelfth annual midwest safety conference in Chicago recently. Among the recipients were the Pullman Car & Mfg. Corp., Western Electric Co., Victor Chemical Works and the Youngstown Sheet & Tube Co.

¶Closing on Saturdays of all scrap yards in the metropolitan district is being considered by the New York chapter of the Institute of Scrap Iron and Steel institute as a means of enforcing the 40-hour week prescribed by the scrap code.

Meetings

ENGINEERS and builders from every important country will meet in London, June 20-23, to discuss the most recent advances in building with steel. Under the supervision of the British Steelwork association, the conference will be joined by engineers of similar organizations in United States, Germany, France, Belgium, Holland, Poland and other countries.

¶American Ceramic Society and National Brick Manufacturers' Research foundation will hold their 1935 annual meeting at Buffalo, the week of Feb. 17. Ross C. Purdy, 2525 North High street, Columbus, O., is general secretary.

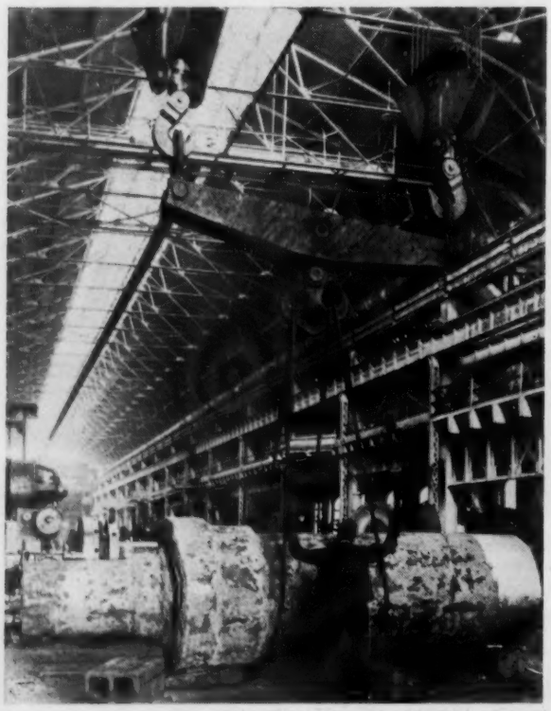
Production

CURTAILMENT in the Youngstown, Chicago and Wheeling districts last week pulled the steel operating rate down 3 points to 59 per cent, first decline since the last week of March.

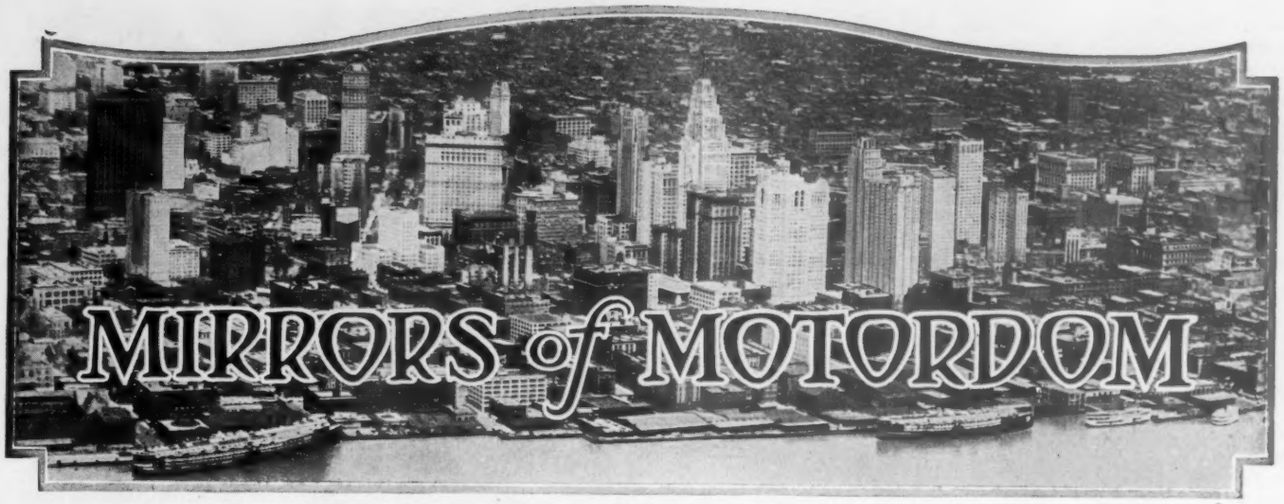
Further labor trouble in the automobile industry is tending to restrict production; threats of labor difficulties in the steel industry are prompting production for stock. Advance schedules for this week indicate further reduction. Details follow:

Youngstown—Declined 5 points to 62 per cent last week, with little change indicated for this week. Repairs forced suspension of some district open hearths, of which 53 are

(*Please turn to Page* 73)



HOIST 'ER UP! This huge forging, made by the Midvale Co., Nicetown, Philadelphia, is a spindle for an electric generator built by the Westinghouse Electric & Mfg. Co. The forging weighs 113,045 *pounds, is* 18 *feet* 7 *inches long, its largest diameter being* 72½ *inches*



DETROIT

WITH the retreat from the big spring offensive now in full swing, the automobile industry's chief concern of the moment is to make its spring exit as gracefully and orderly as possible.

Today, few in Detroit doubt that April was the peak to the motor car industry's activity at least for the first half, but they would like to see some semblance of subsequent steadiness, instead of the bottom dropping out of things.

In a large sense the toboggan that automobile production is on now is a keen disappointment. It is a disappointment to that preponderance of opinion that as late as two weeks ago believed the industry was building for a May peak.

It is also a disappointment to those followers of the motor car industry's fortunes to grudgingly be brought to admit that June volume, in turn, will undoubtedly slip beneath that of May.

On the other hand, those more easily reconciled to fate say that to keep on at April's fast clip was really nothing more than at the rate of 5,000,000 cars a year, and that could not be.

Several Reasons for Gloom

So, just as Detroit never knew a happy medium, this year is no exception. Because single shifts now replace triple shifts, three and four-day weekly operations are now the vogue over splitting production schedules of 30 days ago, a pall of gloom has settled over this vicinity for the first time in many months.

Detroit talks as if it were going back into the slough of depression but it should pause in its scurry and find evident a reason for the retreat. No one cause is at the base, but evidently a list of reasons dovetailed late in April to build to what has happened since.

First and foremost, Detroit says the error was gravely serious when auto makers advanced their prices, for, in many cases that extra $25 and $50 was the straw that broke the camel's back. Many have been the cases of car buyers who, while waiting for deliveries, canceled orders, or lukewarm prospects that turned cold.

Secondly, labor strikes of which no city has been spared, obviously have deprived labor of payrolls; consequently, no new automobiles have been bought by these classes.

Recent mid-western droughts have seriously impaired crop prospects, farmers have pulled in their horns, rural automobile sales have suffered.

Fourth, and as all truth will out, the motor car makers themselves have all this while been stocking cars against their worst fears—an automobile strike. While labor took sporadic shots at them, producers took no chances.

Bulk Producers Scaling Down

Many is the warehouse today stored with finished cars or finished parts. In Detroit alone there are at least three large storerooms that probably house upward of 25,000 cars. Furthermore, there are parts finished and stored in Detroit for thousands of more cars.

So, the industry's ideas came in May this year, not in March, for the fifteenth of the month falling as it did last week, saw retrenchment in assemblies the password for the motor industry.

For the time being, the auto producers line themselves up into two distinct classes. There are those whose unfilled orders still bulk fair and who, for usually more than one reason, haven't been able to turn out cars all spring at their normal swing. Then, in the second class there are those makers who fall into the division that have had to make assembly cuts, and whose order backlogs are off.

Into the former class come Olds, Chrysler, DeSoto, Hupp, Cadillac-LaSalle and last but not least, Ford.

Into the latter class—that group which has already scaled down noticeably—fall Chevrolet, Dodge, Plymouth, Buick, Pontiac, Graham and Packard. The trend is for the former class to gradually merge into the latter division.

Just as they have often been down but never out, schedules in the automobile plants may be on the skids right now but their management does not lack for new ideas.

Report is strong in Detroit that today's hiatus to activity has been the cause of launching afresh the idea that what America needs more than a good 5-cent cigar is a good cheap automobile.

None of the "big little three" has lacked for plans of this nature, but Dodge and Plymouth are closest to fact. Paralleling Chevrolet's trimmed-down standard six, Dodge will soon have a small economy car in production, but whether it will be marketed under the name of Dodge or Plymouth is still undecided.

Chrysler Corp.'s plans are even more ambitious than this, however. About June 1 changes in parts' specifications on the Plymouth line proper are expected out for bids and as one report has it a new Plymouth should be out by Sept. 1. Many expect it will carry some, but not all, of the features of the airflow Chrysler and DeSoto. Incidentally, some parts' cancellation on the airflow coupe indicated last week this particular model might be discontinued.

Revamp Designs To Win Sales

Plymouth's Highland Park engineering laboratory has been working overtime recently, thus confirming suspicions quite widespread in Detroit that Chrysler Corp. will have something new earlier this coming fall than usual. Dodge, for one detail, has a new front-end planned, recent experiments being for an appearance a shade more conservative

than the airflow's stubbiness, and with a new type of punched instead of slotted radiator grille work.

Last week Chrysler bought the old unused West End LaSalle plant from General Motors and it has been a cause of speculation since what use this body plant will be put to. Since the first of the year Chrysler has either leased or indirectly taken space in Continental Motors' Detroit plant, Willys-Overland Co. plant at Toledo, O., the Packard plant in Detroit, and now in the LaSalle works.

Ford recently has tooled up to some extent for quantity production on a smaller car, but retooling took place only in a few departments, thus indicating that all plans are not ready to go ahead.

Detroit understands the smaller Ford will also make an appeal to economy transportation, will be smaller and lighter, though retaining the present V-8 motor. Some radical change is in prospect for the V-8 motor's connecting rods on this small car, with Ford thinking some of minimizing the number of constituent parts.

Also a formidable threat to the much-talked of $300 field for automobiles is Pontiac. Now that the Buick "40" promises to cut deeply into Pontiac sales, the latter is thinking seriously again of sponsoring the low-price 4-cylinder motored car it first planned last year for bringing out at the time of the Century of Progress.

Last week Pontiac is reported to have bought some five carloads of press equipment from Willys-Overland at Toledo, O., consigned this equipment to Pontiac, and observers link this move with a revival to the 4-cylinder car for this General Motors subsidiary.

Assemblies Show Mixed Trend

Chevrolet last week, its assemblies down to 16,000 units from the 19,000 of the week before, found unbalanced banks of parts in feeder plants. For instance, a month ahead on axle assemblies, the axle division operated only four days weekly, some departments three.

Pontiac was unchanged at 1500 units last week. Dodge was steady at 3500. Buick's assembly line was closed on account of the strike at Fisher Body's nearby No. 1 plant at Flint. Buick's condition seemed serious because only some 1200 of the new series "40" have been produced. Hudson-Terraplane slipped a little last week, from 4000 units the week before to 3600. Incidentally, Terraplane has introduced a Challenger series, 112-inch wheelbase, with 80-horsepower motor, including four body types. Prices start at $565.

At Ford, where a company spokesman last week said they were 10 to 12 days behind on deliveries, the daily rate was fairly steady at close on to 5000 models daily, or 24,000 for the week, this figure counting passenger and commercial cars.

Other production statistics for last week, according to *Cram's Reports*, are: Auburn 240, down 50; Cadillac-LaSalle, 560, down 90; Chrysler unchanged at 1950; DeSoto unchanged at 1200; Graham 450, down 90; Hupp 355, down 15; Nash 1625, up 625; Olds 3300, down 200; Plymouth unchanged at 12,000; Reo 650, up 150; Willys 1250, compared with none the preceding week (receivers hope for a court order for 4000 a month). Total output for the week ended May 19 was 75,550 units against 79,305 the first week preceding and 90,200 the second.

MAPI Hits at Securities Act

HOLDING its annual meeting in Cleveland, May 14-15, the Machinery and Allied Products institute elected an executive committee of 15 members and gave consideration to code matters. A code authority was elected at an industries meeting held in conjunction with the institute meeting.

Sessions on the first day were general in character, while on the second day 28 separate meetings of various machinery and allied products groups were conducted. Total attendance was about 350, with all proceedings closed except to members.

Members of the executive committee were elected as follows: P. C. Brooks, executive vice president, Fairbanks, Morse & Co., Chicago; W. C. Dickerman, president, American Locomotive Co., New York; Robert E. Friend, president, Nordberg Mfg. Co., Milwaukee; Robert M. Gaylord, president, Ingersoll Milling Machine Co., Rockford, Ill.; Leo W. Grothaus, Allis-Chalmers Mfg. Co., Milwaukee; George H. Houston, president, Baldwin Locomotive Works, Philadelphia; D. C. Keefe, executive vice president, Ingersoll-Rand Co., New York; A. M. Mattison, president, Mattison Machine Works, Rockford, Ill.; C. E. Searle, executive vice president, Worthington Pump & Machinery Corp., Harrison, N. J.; Harold C. Smith, president, Illinois Tool Works, Chicago; George P. Torrence, president, Link-Belt Co., Chicago; C. S. Wagner, vice president, Koehring Co., Milwaukee; Philip M. Morgan, president, Morgan Construction Co., Worcester, Mass.; M. F. Dunne, president, Pyott Foundry & Machine Co.; Chicago; and Guy A. Wainwright, president, Diamond Chain & Mfg. Co., Indianapolis.

Officers elected when the institute was organized late in 1933 will hold over. They are: President, John W. O'Leary, Chicago; vice president, H. C. Beaver, president, Worthington Pump & Machinery Corp., Harrison, N. J.; secretary, Paul C. DeWolf, vice president, Brown & Sharpe Mfg. Co., Providence, R. I.; and treasurer, Robert H. Morse, president, Fairbanks, Morse & Co., Chicago.

Elected to the code authority for the machinery and allied industries, of which Mr. O'Leary is chairman, were eight members of the MAPI executive committee—Messrs. Brooks, Dickerman, Friend, Grothaus, Houston, Mattison, Torrence and Wainwright—and W. S. Shipley, president, York Ice Machinery Corp., York, Pa.; Mr. DeWolf; N. W. Pickering, president, Farrel-Birmingham Co., Ansonia, Conn.; and Denis F. O'Brien, A. P. Smith Mfg. Co., East Orange, N. J.

The durable goods industries will cease to exist and the ten million there employed will be forced to seek employment elsewhere unless the government sanctions wage and working schedules that will permit these industries to sell their products by inducing purchase by a reasonable schedule of prices, was the prediction made by Mr. Houston, chairman of the durable goods committee advising the NRA, in addressing a dinner meeting.

Two Policies Conflicting

Principles guiding the national administration are irreconcilable with the capitalistic system, said Mr. Houston. National policies are being determined by a group of men who are not in sympathy with much held sacred in our capitalistic system. The two plans can not live side by side—either they are wrong, or we are, he declared.

Mr. Houston stated that the next 12 months will prove whether the administration is right or wrong. He also assailed the securities act of 1933 as "probably the greatest barrier ever conceived in modern times against the natural flow of capital."

Col. Leonard P. Ayres, vice president and economist, Cleveland Trust Co., Cleveland, told members of the institute that prospects for the durable goods industries, which include half of the country's 9,000,000 unemployed, constitute the key to the depression, but six barriers, partly interposed by governmental regulation, must be overcome.

These barriers were listed by Colonel Ayres as follows: Shrinkage of foreign trade; high cost of building construction; difficulty of obtaining building loans; difficulty of making industrial profits under NRA codes; the federal securities act, which "operates to strangle the market for new funds," and restrictive regulation of stock exchanges; fear about the future of American money.

WINDOWS OF WASHINGTON

WASHINGTON

WHEN Pennsylvania Republicans in last week's primary election renominated Sen. David A. Reed over his opponent Gov. Gifford Pinchot, they administered another blow to the New Deal.

In his campaign, the governor had indorsed the main principles of the New Deal. He had been a White House guest and generally was regarded as being favored by the administration. On the other hand, the New Deal has had no more zealous or consistent opponent than Senator Reed.

Because Pennsylvania is a consistently conservative, Republican state Senator Reed's victory is not regarded here as indicative of the present attitude throughout the length and breadth of the land. His victory is important more because of its moral significance. It is having the effect of rendering more vocal the opposition to the New Deal.

In this respect, the Washington atmosphere has undergone a vast change of late. When the New Deal was launched last March with all the force of a vast crusade, its momentum simply reduced opposition to a state of impotency.

Hopkins To Be Housing Head?

So far, opposition to the New Deal has by no means reached a perfectly organized stage, but it has developed to the point of being recognized—the critics have come out of their cyclone cellars.

Opponents of the New Deal show less fear of being called Tories, deadcat slingers and other opprobrious epithets.

On top of the welter of criticism which has descended upon NRA from different directions, the President has announced his long-awaited housing plan and apparently it will not be General Johnson who will execute this plan. It now is expected that the director of this program will be Harry L. Hopkins, federal relief administrator.

The general gives every indication of having his time fully occupied with NRA. The immense number of existing codes, their ambiguous phrasing, their overlapping and contradictions constitute a problem which is proving most difficult, if not impossible, to unscramble.

The job of obtaining compliance under many of the codes appears to have become almost utterly demoralized. One observer comments that compared to this compliance job, that of enforcing prohibition was a simple part-time assignment.

Look for Code Reshufflings

Different moves are being considered. Thought is being given to the elimination of a great many individual industry or trade codes. The merging of certain codes has been considered. The possibility of eliminating price and trade practice provisions, and leaving in only those sections covering labor, hours and wages, has been extensively considered. There is a possibility of an attempt at price-fixing.

While NRA is the hottest poker which the administration now is handling, Washington knows that this organization has served one exceedingly valuable purpose.

NRA has shattered forever the old sanctity of the antitrust laws. It is believed here that never again can there be a return to the old days of cut-throat competition.

As to the President's housing plan, this is the one on which Frank C. Walker, director of the national emergency council, has spent so much time. It has been changed greatly since its original conception and is believed now to be free of features that would have a stifling effect on mortgage or financial interests in this country.

The Walker plan, introduced in congress as the "national housing act," would eliminate the necessity for costly second mortgage financing. It would create a system of mutual mortgage insurance and encourage the organization of insitutions to handle home financing.

The whole system would operate under rigid government supervision, and would supplement the activities of the present Home Owners' Loan Corp. The credits available under the Walker plan would be restricted to a maximum of $2000 each and are expected to be applied in the great majority of cases to home renovizing and new home construction.

Enactment of the national housing act will give to steel house fabricators the brightest opportunity they have ever had, in the opinion of government housing experts.

But in their opinion it still remains to be demonstrated whether the steel industry can develop steel or part-steel houses of attractive appearance, and desirable living qualities, and which will sell at low prices.

A new development of interest to steel house fabricators is a plan for a low-cost farmhouse which has just been completed by the bureau of agricultural engineering here. The plan calls for unit construction. While the house could be built of any desired material, it is thought that its design offers an opportunity particularly for steel.

Can't Spend Money Fast Enough

Whether or not steel houses play an important part in the carrying out of this housing program, those who will be benefited include manufacturers of sheets, pipe, roofing, plumbing goods, hardware and house trim and accessories.

Another related development is a "pep" meeting held by PWA last week. State PWA engineers from all over the country were called to Washington and instructed to expedite the execution of all projects under allotment.

"We are terribly concerned about the inevitable lag between the time the bond contracts are signed and the time the contract is let. . . . This is a money-spending program. We don't want to build in 1935 what we can build in 1934. . . . Speed is the

thing from now on," enjoined Secretary Ickes.

One of the things that is worrying the secretary is that whereas PWA has allotted $795,000,000 to nonfederal projects, only $62,000,000 of this total so far has been actually spent.

It is clearly apparent that the government, directly and indirectly, will continue to be industry's best customer for the rest of this year and, and that the huge government spending will continue throughout next year and into 1936. The President's request to congress for an additional $1,322,000,000, practically all of which will go into public works and relief, is a positive indication to industry in general as to where it can look for big business.

The first batch of a large number of airplanes to be bought by various departments is being advertised by the army air corps. Bids will be opened June 4, under Circular 538, on 2-engine, bombardment planes, in lots of 50 to 120. And the bureau of aeronautics, department of commerce, will advertise soon for 25 airplanes for the use of its inspectors. The government has been impressed with the development of part or all-metal planes and is open-minded as to materials used in construction.

Soil-Saving To Require Steel

The soil-saving campaign now being waged by CCC units is of interest to the steel industry. Prevention of soil-erosion is effected by controlling and reclaiming gullies and by preventing their formation. Already woven wire has been recommended as a material for use in the construction of soil-saving dams. Now the possibilities of steel piling in this connection are being studied.

Terracing of sloping farm lands and gulley control are being encouraged wherever there is the menace of soil erosion. In gulley control work, corrugated sheet flumes are being increasingly used to carry the flow of water over the spillways, where such spillways are necessary. The use of the steel flumes prevents cutting away of the earth. Machinery used in terracing includes principally tractors and graders.

The soil-saving campaign is a joint undertaking of the departments of agriculture and interior. The former is doing the experimental work in 10 soil-erosion stations located in various parts of the country. The latter has undertaken the demonstration work, under a PWA allottment. The forest service of the department of agriculture is administering the soil-saving work of CCC.

In a limited way, experiments now are being conducted by the bureau of agricultural engineering, department of agriculture, on corrosion-resistant materials which will best resist the corrosive attacks sustained in fertilizer distributing machinery and in spraying equipment for destroying insect pests. In such equipment the problem of corrosion is a serious one.

This bureau has completed a study on milk cooling tanks and another on vaporizing oil burners for farmhouse heating. A feature of the cooling tank findings is that brine tanks give satisfactory life when lined with galvanized or painted black sheets.

Navy Tests Diesel Power Units

In the navy department one of the major activities is in connection with the weldability of steel. An extensive study of hardness and other properties of welds is in process. This is expected to have a bearing on future welding steel specifications.

Of interest to diversified industries is the progress being made by the navy in its dieselization program.

One basic adaptation of diesel engines is that of prime movers for all emergency generators in surface craft. Some 28 vessels recently placed under contract will be so equipped. Consideration is being given to the use of diesels on generators for auxiliary power and lighting. A number of harbor tugs recently have been dieselized.

One of the most interesting diesels so far delivered to the navy is a 12-cylinder, V-type, 950-horsepower, 720 revolutions-per-minute, 8 x 10-inch, 2-cycle, Winton engine. This is now undergoing tests at the engineering experiment station at Annapolis, Md. It is of welded, rolled steel plate construction and has an underslung crankshaft. This is the prototype of sixteen 16-cylinder diesels which the navy has ordered from Winton for powering four submarines now under construction.

In these tests, the navy is paying special attention to bearings. It is using precision bearings and needle bearings largely. The precision bearings are made by using a very thin layer of bearing metal with a heavy steel back. Antifriction bearings are being studied with a view to greater application in diesels. Tests are being made with roller bearings for the main and wrist pin bearings.

Cooling diesel engines by fresh water whenever practicable has been adopted by the navy. All investigations so far indicate that no additional weight is involved by such policy and the problems of maintenance and operation are greatly reduced.

Weight of diesels is being brought down in every way possible. Where castings are used they are of the nickel, chrome or molybdenum series, to permit thin sections. Aluminum pistons are used throughout. All excess weight is carefully removed from the crankshafts and other moving parts.

The lightest diesel, per unit of horsepower, which the navy now has is a 240-horsepower Guiberson motor now being tested at the naval aircraft factory at Philadelphia. This weighs 2.2 pounds per horsepower. The navy expects this weight eventually will be reduced further.

A feature of the navy's experience with diesels is the perfection of their dependable operation. For instance, the navy is having less difficulty in starting diesels at freezing temperatures than it has with gasoline motors.

After having for many years taken test coupons from the bottom of ingots, navy inspectors in many cases now are taking them from the top. The reason is that the carbon content tends to increase toward the top and the navy, in the interest of increased weldability, wants carbon kept within close limits. This practice is said by some steel companies to cause them to crop more off the top of the ingot and hence increase the cost of the steel.

Sales Engineers in Capital

Where comparatively few steel companies and equipment manufacturers formerly had sales representatives in Washington, this number has increased considerably in recent months. In a good many cases companies find that before they can do any selling they will have to get their particular product on to the approved list of the government departments interested. That means that some months will have to elapse before tests can be completed by the departments, and before the manufacturer is able to bid effectively.

Some salesmen, able to talk with authority about the merits and limitations of various materials and products, have had notable success in getting their own material written into specifications covering certain definite applications.

Rolling Mill Co. Leasing Part of Scullin Plant

Col. Harry Scullin, president, Scullin Steel Co., St. Louis, has confirmed the report that American Rolling Mill Co., Middletown, O., through its subsidiary, Sheffield Steel Corp., Kansas City, Mo., is negotiating to lease the eastern section of the Scullin plant, comprising six open-hearth furnaces in the mill section. Transaction will be on a partnership basis and is virutally completed except for minor details. The Sheffield corporation will start operations in a few weeks, with 400 workers and four furnaces.

Industrial Men in the Day's News

S. R. Rectanus To Specialize on Organization and Industrial Relations

He plans to resign his executive position in a leading steel company to take up new work.

Contact work in Washington has convinced him of the need for consultants on management problems.

Active in the steel industry since 1909, he has come up through the ranks from a mill laborer.

S. R. RECTANUS, vice president in charge of operations of the American Rolling Mill Co., Middletown, O., has asked to be relieved of his duties as operating head of the company in order to establish himself as a consultant on management problems, especially those concerning organization and industrial relations.

Recently he has been in Washington in the interests of the durable goods industries committee in its studies of the recovery program and the preparation of a report being made to the President at the request of General Johnson. Mr. Rectanus will remain at the Mayflower hotel in Washington for the time being in connection with the activities of the subcommittee on industrial relations, of which Charles R. Hook, president of the Rolling Mill company, is chairman.

In making this announcement May 15, Mr. Hook said: "Mr. Rectanus' request is prompted by the opportunity which he perceived and the service he can render industry. His contacts in Washington with government departments and industrial executives have indicated real need on the part of many corporations for the kind of service he is in position to give as a result of his many years of experience with Armco."

Mr. Rectanus, who will return to Middletown to complete some special assignments for the company before resigning as vice president and devoting all of his time to his consulting practice, entered the employ of the Rolling Mill company in 1909 as a laborer in the galvanizing department, immediately following his graduation from Purdue university. Becoming superintendent, he was later put in charge of the employment department in 1916 with the title of director of personnel relations and specializing in organization and industrial relations.

In 1923 Mr. Rectanus moved from Middletown to Ashland, Ky., when the Rolling Mill company began the construction of its continuous sheet mill there, later becoming assistant manager and works manager of the Ashland division. After a year as assistant to the general manager he was elected vice president in charge of operations on Jan. 1, 1930, making his home in Middletown.

Mr. Rectanus is a director of the American Management association, the American Iron and Steel institute, and other technical industrial and social organizations.

□ □ □

John C. Hopkins has been appointed district sales manager of the General Refractories Co., Philadelphia. He formerly was identified with the Penn Iron & Coal Co., the Buffalo Union Furnace Co., Republic Iron & Steel Co. and the Massillon Iron & Steel Co. In 1911 he became associated wtih the American Steel & Wire Co., Central Furnace division, Cleveland, and since then has held various posts at all the company's blast furnace plants. In December, 1922, he was appointed superintendent of the Central furnaces and in 1929, general superintendent of blast furnaces and steelworks, serving in this capacity until recently. His new headquarters are in the Leader building, Cleveland.

James P. Raugh is associated with the same office.

□ □ □

W. J. Clucas, Detroit district sales manager for Columbia Steel & Shafting Co. and Edgar T. Ward's Sons Co., has resigned to become affiliated with the sales force of Rotary Electric Steel Co., Detroit, on June 1.

Harry Reno, formerly assistant sales manager at Detroit for the Ward company, has been appointed to Mr. Clucas' position with the Ward company, but no successor has been named for the Detroit sales managership of the Columbia company.

□ □ □

C. Frank Troop has been appointed manager of the automatic sprinkler division of Power Piping Co., Pittsburgh.

□ □ □

C. D. Adams, president of the Air Reduction Co. Inc., New York, has been made deputy NRA administrator in charge of the finance and insurance codes.

□ □ □

Charles F. Stone, president, Atlantic Steel Co., Atlanta, Ga., has been appointed a member of the advisory board of the Atlanta loan agency of RFC.

□ □ □

Edwin J. Schwanhausser, manager of the Buffalo works of the Worthington Pump & Machinery Corp., has been elected a director of the Buffalo chamber of commerce for a three-year term.

□ □ □

Deane S. Holt, European representative of the Harnischfeger Corp., Milwaukee, has returned to the United States for the first time in four years to visit the general offices and plant.

□ □ □

Henry W. Armstrong, secretary and treasurer of the Joseph Dixon Crucible Co., Jersey City, N. J., has been elected as one of two new directors of the National Association of Manufacturers.

□ □ □

J. M. Wakefield has been appointed plant superintendent for the Holyoke Co. Inc., Holyoke, Mass., manufacturer of insulated wire. Previously he has been affiliated with the General Cable Corp. and the Detroit Insulated Wire Co.

□ □ □

Dr. Norman E. Woldman, formerly metallurgical engineer for Westinghouse Electric & Mfg. Co., has opened his own consulating chemical and metallurgical laboratories at 10161 Euclid avenue, Cleveland, under the name Crystal Engineering Laboratories. He is the author of numerous

technical papers and has written two textbooks.

□ □ □

William Scherr has been named manager of the New England territory for the Patterson Foundry & Machine Co., East Liverpool, O., with headquarters at Boston.

□ □ □

Charles W. Moore, for the past 16 years identified with the industrial burner field, has become affiliated with the Shunk Mfg. Co., Bucyrus, O., where he has designed and developed a complete new line of oil and gas, and combination oil and gas burners.

□ □ □

Ralph P. Brown, formerly in charge of publicity for the National Lime association and the Brown Instrument Co., and recently conducting an independent business paper editorial service in Cleveland, has been appointed to the advertising department of Timken Roller Bearing Co. and Timken Steel & Tube Co. to co-operate with business and technical press editors in preparation of articles dealing with bearings and alloy steels.

□ □ □

B. D. Kunkle, president and general manager of the Delco Products division of General Motors Corp. at Dayton, O., has been appointed assistant to vice president C. E. Wilson of General Motors at Detroit.

F. H. Prescott, president and general manager of the Guide Lamp division at Anderson, Ind., succeeds Mr. Kunkle at Delco Products.

F. L. Burke, factory manager of the Guide Lamp division, succeeds Mr. Prescott.

Died:

WILLIAM E. COREY, 68, from 1903 to 1911 president of the United States Steel Corp., at his home in New York, May 11.

Born in Braddock, Pa., in 1866, Mr. Corey entered the steel industry through the laboratory of the Edgar Thomson Works of Carnegie Bros. & Co., Pittsburgh. Attending night school and concentrating his studies on chemistry and metallurgy, he advanced rapidly and in 1887 was made superintendent of the plate mill of the Edgar Thomson Works.

One of Andrew Carnegie's "boys," Mr. Corey for many years followed Charles M. Schwab in the line of promotion, eventually succeeding him as president of the Carnegie Steel Co., and in 1903 as president of the Steel corporation.

Resigning in 1911, to be succeeded by James A. Farrell, Mr. Corey rested four years, then from 1915 to 1923 was president and later chairman of the Midvale Steel & Ordnance Co. Although retired from active business, at the time of his death, he was a director of the Baldwin Locomotive Works, Vanadium Corp. of America, International Nickel Co., Mesabi Iron Co., and a number of other corporatroit, in Ludlow, Mass., May 5, follow-ican Iron and Steel institute, American Institute of Mining and Metallurgical Engineers, and the Iron and Steel Institute of Great Britain.

□ □ □

Edwin L. Crosby, 53, president of the Detroit Electric Furnace Co., Detroit, in Ludlow, Mass., May 5, following an automobile accident. On leaving the Plymouth, Mich., high school he entered the employ of the Semet-Solvay Co., Detroit, later taking charge of its electrical operations. In 1905 he went with the Detroit Edison Co., for 13 years being chief power salesman. In 1918 he organized his own company, becoming vice president and general manager, and president in 1920. He was a member of the American Foundrymen's asso-

William E. Corey

ciation and the Electrochemical society.

□ □ □

Samuel D. Sleeth, 81, for many years prior to his retirement foundry superintendent and general superintendent of the Westinghouse Electric & Mfg. Co. and Westinghouse Air Brake Co., at Cambridge Springs, Pa., May 9. He was a former vice president of the American Foundrymen's association, was active in the Pittsburgh Foundrymen's association, and was noted for his innovations in foundry practice.

□ □ □

Silas H. Altorfer, 50, president, A. B. C. Washing Machine Co., Peoria, Ill., May 14.

□ □ □

Walter J. Sutherland, 40, assistant treasurer of the SKF Ball Bearing Co., New York, in that city, May 10.

□ □ □

Leonard G. Woods, president, Union Springs & Mfg. Co., Pittsburgh, in Pittsburgh, May 13.

□ □ □

Thomas J. Gillespie, for more than 40 years traffic manager of the East Jersey Pipe Co., New York, and its associated companies, May 13.

□ □ □

Ernest H. Cornelius, president, Oklahoma Steel Castings Co., Tulsa, Okla., May 8.

□ □ □

Paul C. Kammerer, 65, member of the firm of the Pittsburgh Instrument & Machine Co., Pittsburgh, in Pittsburgh May 13.

□ □ □

W. A. Black, 47, general manager, Automatic Products Co., Detroit, screw machine products, and well-known in the Detroit steel fabricating industry, in Detroit recently.

□ □ □

Paul Soden, 69, retired vice president of the John Illingworth Steel Co., New York, and at one time connected with the John Atha Steel Co., Newark, N. J., in Essex Falls, N. J., May 10.

□ □ □

William H. H. Stevenson, 86, formerly president of Stevenson & Co., Baltimore, machinists, in Baltimore, May 14. The company was dissolved recently after 60 years of operation.

□ □ □

Frank W. Adams Jr., for the past several years representative in the Dayton, O., territory of the Ex-Cell-O Aircraft & Tool Corp., Detroit, in Dayton recently.

□ □ □

Lewis F. Ostrander, 63, founder and president of the former O-E Specialty Mfg. Co., in Milwaukee, May 11. He was prominent as a designer of heating and ventilating equipment.

□ □ □

Joy Morton, 78, widely-known industrialist, in Chicago, May 10. Although best known as chairman of the Morton Salt Co., he had stock interests in a number of corporations, including steel.

□ □ □

Norman Seidle, executive of the Tank Builders' association, Chicago, May 14, at his home in La Grange, Ill. He was formerly with the Youngstown Boiler & Tank Co., Joseph T. Ryerson & Sons Inc., and the James G. Heggie Boiler Co.

□ □ □

Oliver H. P. Champlin, 69, secretary of Strong Steel Foundry Co., Buffalo, May 12. He was identified with the steel foundry industry since 1907, at which time he founded the Strong company. He was active in the business as president and treasurer until 1928.

□ □ □

John T. Hill, 75, well-known steel commission salesman of Baltimore and Washington, in Baltimore, May 12. Identified with the steel business since he was 12, in recent years he handled products of the Phoenix Iron Co. and the Central Iron & Steel Co. in sales to the government.

To Address American Iron and Steel Institute

L. S. Marsh

BUSINESS before the technical will be the order of the program of the American Iron and Steel institute at its forty-third general meeting at the Hotel Commodore, New York, May 24.

Opening the forenoon session at 10 a.m., Charles M. Schwab, chairman both of the Bethlehem Steel Corp. and of the institute, as usual will review the current situation in iron and steel. Since Mr. Schwab, nestor of the American iron and steel industry, returned recently from a European trip, a comparison of recovery in Europe by natural processes and in the United States under NRA may be expected.

Following Mr. Schwab's general observations on the market situation, Walter S. Tower, executive secretary, of the institute will talk on "The Operation of the Iron and Steel Code." Since Sept. 20, 1933, secretary of the institute, Mr. Tower previously was manager of commercial research for the Bethlehem Steel Co. His previous experience included a period as commercial attache to the American embassy in London, trade expert to the United States shipping board, and trade advisor to the Consolidated Steel Corp.

"Some Characteristics Common to Carbon Steel and Alloy Steels" will be discussed at the afternoon technical session by E. C. Bain, metallurgist in the research laboratories of the United States Steel Corp., at Kearny, N. J. Since August, 1928, he has been with the Steel corporation,

Charles M. Schwab

E. C. Bain

the four preceding years having been research metallurgist for the Union Carbide & Carbon research laboratories, Long Island City, N. Y.

"Progress in the Welding of Steel" will be described by Everett Chapman, vice president in charge of research for Lukenweld Inc., Coatesville, Pa. A graduate of the University of Michigan, he has been associated with Lukenweld since 1930. Among his achievements is the design of the welded crankcases used in the diesel engines propelling the new Union Pacific and Burlington streamline trains, the latter being described in STEEL for May 7.

Lawrence S. Marsh, manager of the inspection and metallurgical department of the Inland Steel Co., Chicago, who will speak on "The Progress and Outline of the Work of the Technical Committee," is a graduate of the University of Michigan.

Going to Chicago in 1902 as chemist for the Illinois Malleable Iron Co., he later became chemist and chief inspector of the Rock Island railroad. Then followed service with the city of Chicago as engineer of tests of the bureau of engineering, from which he resigned on Jan. 1, 1922, to join the Inland company.

Last Jan. 1 Mr. Marsh was made chairman of the institute's technical committee and also became president of the Association of American Steel Manufacturers' technical committees.

Walter S. Tower

Everett Chapman

EDITORIAL

Balancing Incentives for Large and Small Plants

IN RECENT months members of congress and officials of certain government agencies have expressed much concern over the plight of the "little business man." They usually have in mind tradesmen, merchants, etc. The recent rumors that NRA would abandon codes affecting small businesses hinted that "small business" was meant to refer to dry cleaning establishments, laundries, barber shops, etc. Seldom does a government official express concern over the small business unit in industry. Occasionally when a Borah or an agency like the federal trade commission reports or acts in behalf of small units in industry, their efforts are ineffectual because they do not understand industry. In the mind of the average run-of-mine congressman, industry is a collection of super-trusts. In his consideration of legislation affecting industry, he thinks in terms of restrictions that will curb the larger corporations. Rarely does he give serious consideration as to how such legislation may affect the smaller units.

As a matter of fact, the small producer or manufacturer in industry operates under certain disadvantages. These are quite apart from the effects of NRA codes or of other government influence. The real hardships come from certain alignments and practices which have developed over a long period of years. Some of these handicaps have been brought to light in the administration of codes, but the problem has not been intensified by the codes. It existed before codes were drawn.

Competing With Own Customers Is Irritant In Many Branches of Steel Industry

One of these conditions, which is common to practically every industry, is the practice by which a large producer of raw materials sells part of the material in semifinished form to certain small customers for finishing, yet at the same time finishes some of the material in its own plants and sells the finished product in direct competition with the products of its customers of semifinished products. This is the basis of serious concern in the structural steel fabricating industry and it is a constant irritant in other branches of the steel industry, and in other industries.

Another condition which leads to misunderstanding is found in the relations between automobile builders and the supplier of automobile parts. Parts makers frequently complain bitterly because of the unreasonable demands made upon them by certain large automobile companies. At times these smaller units must be prepared to jump from zero to 100 per cent operations in a few hours. Their operations sometimes are halted to the extent of 100 per cent by a telephone call or a telegram from Detroit. The sellers have little control over the prices they receive for their product. While some of the large automobile companies are much more reasonable than others, it is no secret that considerable business is placed with these small units on the basis, "Here is the order and here is the price; take it or leave it."

Units To Preserve Existence of Both Conditions Must Be Fair to All Interests

The predicament of parts makers has been intensified every time the automobile builders have raised wages in their plants. Usually the employes in the parts plants feel that their income should follow the general trend of wages in the assembly plants. The parts companies, while forced to increase wages to keep pace with the builders, do not always have the freedom to increase their selling prices to compensate for the increased cost. It is quite possible that a thorough examination of conditions in this particular field of industry would show that a few of the larger companies are not entirely fair in their dealings with the smaller units.

The entire question is one of great importance economically. It will be admitted that the well-being of the nation demands that both small and large plants be given opportunities. If conditions make it too hard for small units to operate they will gradually merge and industry in time would consist of a small number of large units. On the other hand, if the restrictions against large corporations become too great they will in time be forced to disintegrate.

It is extremely desirable that a reasonable balance be maintained so that a healthy incentive always will be afforded the right kind of small companies. No one should be more interested in maintaining this proper balance than the large corporations themselves. Their executives should remember that when the number of small companies is reduced below the danger point, the power of the larger companies becomes so great that federal control of the resulting monopolies becomes inevitable. Therefore, to insure the freedom which all industry cherishes so highly, it is necessary that the small units be afforded their proper place in the sun.

THE BUSINESS TREND

Outlook for June Business Blurred by Mixed Trends

VIEWING prospects for industry in the next few months, company executives hold conflicting opinions. At no time since last summer have business observers in industry been so definitely allied with the rival camps of bears and bulls as they are today.

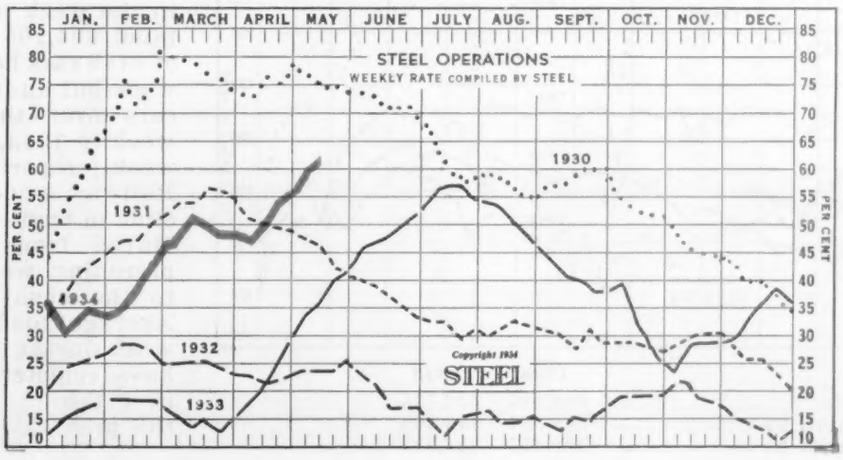
For the most part, the pessimists are those who usually are heavily influenced by trends in the securities markets. These industrialists look upon the recent weakness in stocks as a sign of marked dullness during the summer. Some of the extremists talk of an extended period of slack business. The cohorts of this camp also find strong support for their bearish attitude in the recent persistent weakness of the iron and steel scrap markets.

The more sanguine observers in the opposing camp read a different meaning into the behavior of the stock market. They believe that the downward trend in securities values reflected two factors—first, the fear in financial circles of uncertainties arising from the securities act, the securities bill and the market control bill, and second, the feeling that the present activity in industry is not a true index of profits, because NRA and other restrictions have seriously cut the possibility of profits. They reason that the stock market has fully discounted every possible or probable adverse effect of the present Washington policies, that it has reached the end (or nearly the end) of its downward course, that it will rebound before the end of May, and that the improved tone in securities will bring new courage and confidence to business generally. These members in the camp of sanguineness admit the likelihood of a summer recession, but are bullish on the outlook for the fall.

Current Records of Business Are Indefinite, Hint Easier Pace in Industrial Activity

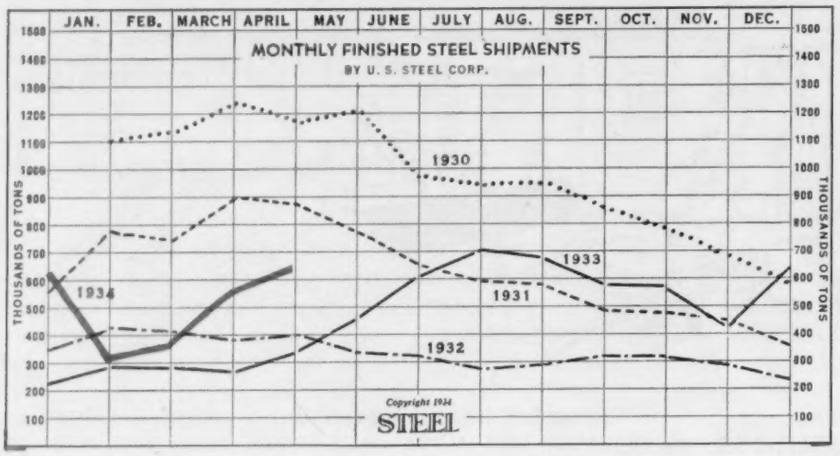
Without commenting on these divergent views, we pass to more tangible signs of business. Steelworks operating rates still are high, but diminishing orders presage an early slackening of production. Freight traffic continues to ease off moderately. Electric power output, after wavering slightly for several weeks, again has turned upward. Strikes in metalworking industry again threaten. On the other hand, the prospect for funds for industry is more encouraging.

Under the circumstances, one will do well to maintain an open mind until the business trend is more clearly defined.



1934	
May 12	62
May 5	60
April 28	57
April 21	55
April 14	51
April 7	48

1933	
May 13	36
May 6	33
April 29	25
April 22	20.5
April 15	17.5
April 8	15.5



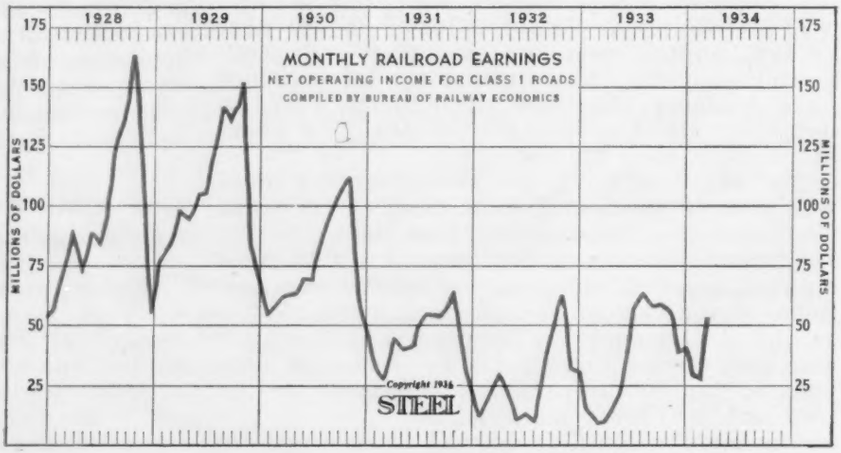
	Tons
April, 1934	643,009
March, 1934	588,209
April, 1933	335,321

Finished Steel Shipments Continue Upward Climb

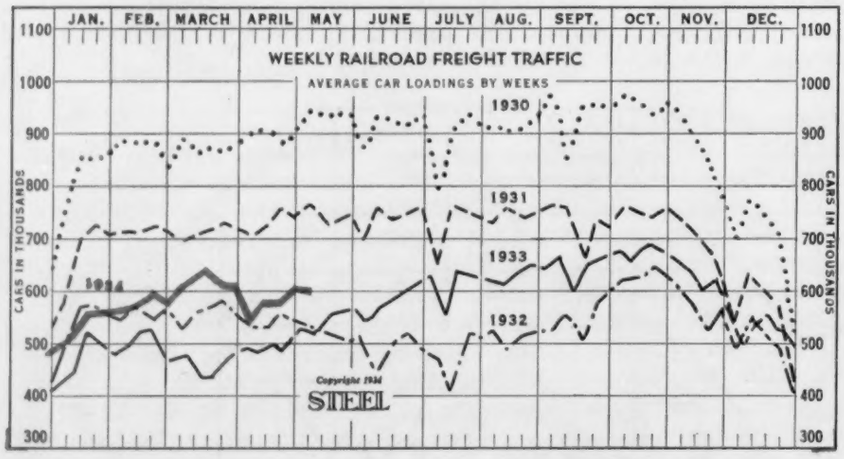
Finished steel shipments by the United States Steel Corp. advanced for the third successive month in April, according to the monthly report of the corporation. Total shipments in April were 643,009 tons, an increase of 54,800 tons compared with a movement of 588,209 tons in March. In April, 1933 finished steel shipments amounted to 335,321 tons. During the four months of this year shipments by the Corporation totaled 1,948,495 tons and compare with a movement of 1,153,181 tons in the same period last year.

Railroad Earnings Up Sharply In March; Earn 2.59 Per Cent

The net railway operating income of the class 1 railroads in March amounted to $52,047,881, which was at the annual rate of return of 2.59 per cent on their property investment, according to reports filed by the carriers with the Bureau of Railway Economics. This is a sharp advancement over the $29,281,013 earned in the preceding month. In March, 1933, net operating income was only $10,815,304 or 0.53 per cent on investment.



March, 1934	$52,047,881
February, 1934	29,281,013
March, 1933	10,815,304



	1934	1933
May 5	604,205	527,118
April 28	608,654	538,809
April 21	589,453	496,512

Freight Loadings Down Slightly; Top Year Ago

Loading of revenue freight in the week ending May 5 totaled 604,205 cars, a decrease of 4449 cars below the previous week but an increase of 77,087 cars over the corresponding week in 1933, according to the weekly report of the American Railway association. The decline in traffic for week ending May 5, from the immediately preceding week was contrary to the usual seasonal trend. Average loadings for May 5 week during the past 15 years have registered a slight gain over the 15 year average for the preceding week.

Ordinary water pails, showing stages of galvanizing. Note the ears and the top and bottom seams, where flux lodges easily if it is not in the proper condition.

CHEMISTRY OF USING GLYCERIN AS FLUX CONDITIONER IN HOT GALVANIZING

BY WALLACE G. IMHOFF
Wallace G. Imhoff Co.

MANY things are done in practice which have never been explained. A concrete example of this statement is the use of glycerin as a flux conditioner in the hot galvanizing process. It is not an uncommon thing to use this material to give a better working flux, yet the literature of galvanizing does not explain why glycerin is used.

There is good reason however why no explanation is available. The reactions in the flux box are extremely complicated and as yet not well known or understood. Also glycerin is a very complicated chemical compound for the ordinary man to understand from a chemical standpoint.

Flux conditions may be broadly divided into three general classes in covering the entire field of hot galvanizing. The first class consists of all those articles which are light and there is small weight entering the bath with the submersion of the article. A typical example of this class of work is to be found in metalware galvanizing where the base metal is 28 gage steel. The articles after being pickled are given a dip in muriatic acid and then put into the flux. This class of work and other similar articles belong to class one which may be said to go into the flux wet. The flux therefore in most cases of this type of work is thin and watery, and glycerin is not used except in a few particular instances. Pine sawdust, middlings, bran, etc. are to be found as a flux conditioner in this type of work. There is really an excess of water present most of the time, and the flux is thin and watery.

The second general class of work is that class which is drained well and partially dried. Wire and pipe are examples in this class. In the first class there are times when there is an actual increase in the water content of the flux; in the second class there is just about an even transfer of water. That is, the amount of water lost in fluxing reactions is just about replenished by the water carried in from the addition of new sal-ammoniac and from other sources. The third class of work is that which goes into

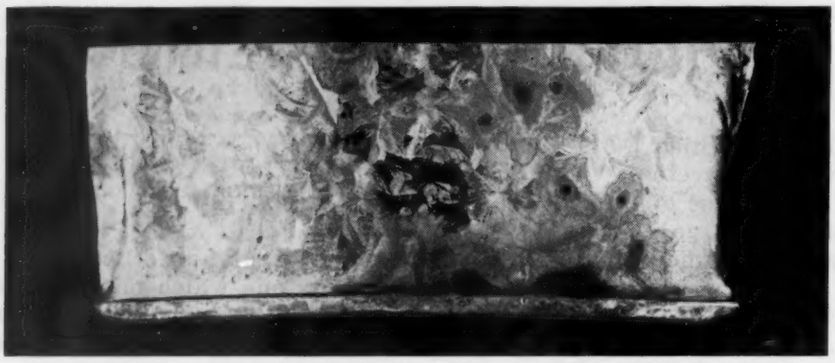
The author is president, Wallace G. Imhoff Co., consultant in zinc coating, Vineland, N. J.

Top bead, at rim of pail, showing flux lodged in rim at upper left

the flux box pretty dry. Castings and fittings are a typical example of this class. Thus the production entering the flux is continually tending to dry it up and make it hard and cakey. As is well known a dry flux quickly sticks to the work and goes down through the bath and may be carried clear out on the work.

Several Sources for Water

Enough has now been said to show that water is the lubricant of the flux; it makes it liquid, glossy, and tends to give it the property of flow which enables it to easily and quickly slip off the work and rise to the top of the bath. Additional water is obtained from the wet work going in, from the liquid flux when used, and from water of crystallization when new additions of salt are added to replenish the flux. The first practical galvanizer to use glycerin as a flux conditioner probably saw that his flux had become dry and cakey, and wanted to find something that would bring back to it the thin, slimy properties which make it useful. He probably did not know that glycerin was a source of adding water again to the flux, although he no doubt recognized at once that glycerin additions improved the character of the flux.



Bottom seam of water pail showing flux lodged in seam at lower right

In order to fully appreciate the action of glycerin in the flux box a few words will be said about the ordinary sal-ammoniac and other materials used for making up the flux. There are many grades of sal-ammoniac, but the usual grade used is what is known as "Coarse Gray" sal-ammoniac. This material is ammonium chloride. To be valuable as a fluxing material it should not only contain water of crystallization, but should be damp in the barrels, and kept damp. In one plant a wet burlap sack is kept over the barrel all the time.

Sal-ammoniac volatilizes at 350 degrees Cent. (662 degrees Fahr.). Zinc chloride volatilizes at 730 degrees Cent. (1346 degrees Fahr.). It can be seen readily that sal-ammoniac will volatilize at a much lower temperature than zinc chloride. Therefore, the basis of the fluxing reactions depends upon the formation of zinc chloride, which is a liquid, to form the body of the flux. Zinc chloride will take up and hold a large quantity of water, and it is the water that is the mechanism through which the flux operates. Thus the reactions in the flux box must be such as to maintain a steady supply of water to give the necessary lubricating qualities to the flux. The first reaction is the formation of zinc chloride and this in turn furnishes the water. In some cases, instead of using the straight sal-ammoniac which contains only a small amount of water of crystallization, many plants now use zinc-ammonium chloride which is a combination of both, or what is known as a double salt. The sal-ammoniac furnishes the ammonia and materials to continue the fluxing reactions, while the zinc chloride which carries a very large percentage of water furnishes the body of the flux, and gives a good medium through which the chemical actions can operate. The first is essential to replenish the flux and keep it in good condition; the second is essential to the successful operation of the first, since it provides a medium through which the first can operate.

Flux Must Be Kept Light

This is a brief practical description of the ordinary steps in the chemical reactions of the flux box. The next thing is to briefly mention the use of flux conditioners and then turn to the use of glycerin as one of these conditioners. The purpose of a flux conditioner is to make the flux light and puffy by filling it full of gas. This is for the purpose of preventing explosions due to the wet, more or less cold articles going down into the hot molten zinc. The flux really acts as a drier, and thus before the steel enters the metal it is more or less dried, and partially heated. When the flux is thin, liquid, and watery this drying effect is too short, and the wet flux and metal are blown out by explosions caused by the moisture. A light puffy flux will not explode as easily as the solid water, or liquid flux. This then is the purpose of a flux conditioner—to make the flux light and puffy so as to avoid spattering and explosions.

A glycerin flux is a thick, more or less viscous, and slimy flux. It is much heavier than fluxes made up with other conditioners, and is therefore an excellent flux for heavy work such as range boilers and tanks. This heavy flux tends to float the boilers and keep them out of the molten metal until they are both heated and dried ready for submersion. A thin flux should be used for light work, such as metalware articles.

Source of Glycerol

Glycerol, $C_3H_5(OH)_3$, the simplest alcohol containing three hydroxyl groups, is a derivative of the inert gas propane, C_3H_8. It has been known for a long time and is commonly called glycerin. Glycerol is a viscous liquid which has the specific gravity 1.265 at 15 degrees. It has a sweet taste; in this respect it resembles the other polyatomic alcohols. When pure it is colorless, melts at 17 degrees after solidification in a freezing mixture, and boils without decomposition at 290 degrees. When distilled in the presence of salts slight decomposition takes place. Glycerol is miscible with water, alcohol, and chloroform, but is insoluble in ether. It is hygroscopic and will absorb more than one-half its weight of water from the air. Glycerol is produced in the alcoholic fermentation of sugar and, consequently, occurs in all fermented liquors. The amount of glycerol formed in the fermentation is about 3 per cent of the weight of the sugar.

Glycerol, or glycerin as it is known to the practical galvanizer, is obtained commercially from animal fats or from oils which occur in plants. The chief sources are tallow and olive oil. It is also obtained as a by-product in the manufacture of soap and candles. The glycerol is separated from the aqueous liquid obtained in these processes by evaporating the solution after precipitating impurities with iron salts. Pure glycerol is obtained by distilling the residue under diminished pressure with superheated steam. The excess of water is removed by evaporating the solution in vacuo until the glycerol has the specific gravity of about 1.262.

Glycerol has been prepared synthetically by methods which lead to the view that it is a trihydroxyl derivative of propane. When the trichlorpropane of the structure $CH_2Cl.CHCl.CH_2Cl$ is heated with water at about 170 degrees the halogen

atoms are replaced by hydroxyl groups, the reaction being analogous to the preparation of alcohol from ethyl bromide. The equation for the reaction is,—

$$\begin{array}{l} CH_2Cl \\ CHCl \\ CH_2Cl \end{array} + 3HOH = \begin{array}{l} CH_2OH \\ CHOH \\ CH_2OH \end{array} + 3HCl$$

The reactions of glycerol with other substances are in accord with the structure which is arrived at from an interpretation of the methods made use of in its synthesis. The presence of three hydroxyl groups is shown by the composition of the products formed as the result of the action of the chlorides of phosphorus on glycerol. Under the proper conditions phosphorus trichloride will replace one, two, or three hydroxyl groups in glycerol by chlorine atoms. Glycerol, like other alcohols, reacts with strong inorganic acids and forms etheral salts. When heated with hydrochloric acid, compounds are formed in which one or two hydroxyl groups are replaced by halogen atoms. These substances which have the structure represented by the formulas $CH_2OH.CHOH.CH_2Cl$ and $CH_2Cl.CHOH.CH_2Cl$ are called monochlor and dichlorhydrin respectively.

It can now be very readily seen why there has never been anything written on the chemistry of the fluxing reactions when glycerol, or glycerin, is used as the flux condition. From the foregoing chemistry of glycerol it is seen that even the chemistry of glycerol alone is very complicated without mixing it in with other unknown and complicated chemical reactions.

Water Is Released

Practically all fluxes are very acid in character, and contain more or less quantities of free hydrochloric acid. From the equations given with glycerol the explanation seems to be that the chemical reaction is reversed, and that the chlorine of the sal-ammoniac is combined with the glycerin releasing the water present and forming glycerol chlorides. This reaction is no doubt very similar to the reaction which forms zinc chloride. The molten zinc is a very powerful reducing agent, and the chlorides formed with the glycerol give a very much thicker and more viscous flux than is obtained with zinc chloride.

The ordinary chemical reactions in the flux box produce zinc chloride, zinc oxide, zinc hydroxide, and basic zinc salts. The chemical analysis of the flux shows also a high percentage of ammonium chloride, and no doubt there is the combination of zinc-ammonium chloride and other zinc compounds. In addition to these various compounds the flux always carries more or less shot, the size and quantity being affected by the viscosity of the flux. A thin flux usually carries small shot, while a thick viscous flux carries large shot.

As stated before no one knows just what does go on in the flux box. The yellow flames and the smell of ammonia shows that at times there are very large volumes of ammonia gas liberated. It is also known that a considerable quantity of hydrogen is given off, and the practical use that is made of these chemical reactions is to "burn off" the flux by lighting this gas when raw sal-ammoniac is thrown on zinc ashes that have accumulated over the bath surface. Glycerol can also be readily oxidized and when it burns it does so with a blue flame. Oxidation of glycerin under the proper conditions produces glyceric acid and tartronic acid.

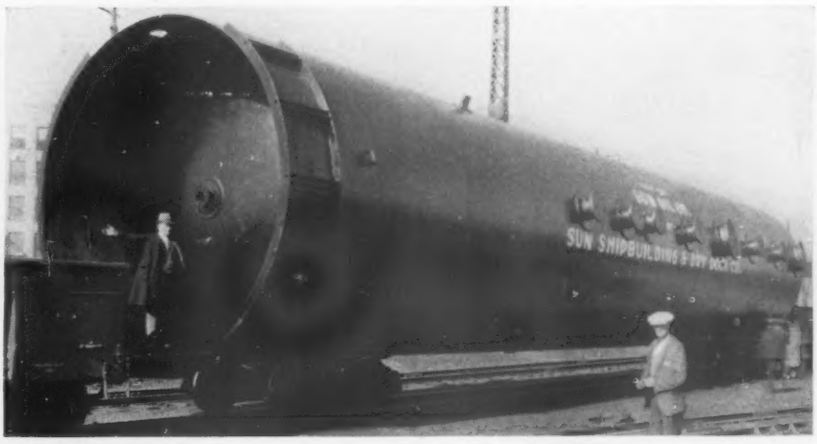
Aids Flux Fluidity

From a practical standpoint, at least in so far as the galvanizer is concerned, the important features in the chemistry of using glycerin as a flux conditioner are that the glycerin provides a medium for supplying and holding water in the flux. Water is absolutely essential as the medium through which the flux can act, and also through which the chemical reactions can go on. It also provides the fluidity necessary in a good working flux so that it can slip off the work easily, and not burn on to it, as a dry, cakey flux usually does. The chemical reactions which take place appear to form chlorides with the glycerin much the same as the zinc chloride is formed, the molten zinc acting as a strong reducing agent. As is seen by reversing the chemical reactions given with hydrochloric acid three molecules of water are formed, and it is this water that gives the flux its life, or good working qualities. A good flux is glistening and shiny; it acts like a cork when the work is submersed under the molten zinc, rising to the surface of the bath, and establishing good coating conditions on the work. A dry flux sticks tight to the work and goes right down through the bath and comes out on the work leaving the steel bare and exposed at the spot where the flux has stuck. A thin flux is particularly desirable on work that has seams and places for the flux to lodge in. That is why a thin flux is desirable for metalware articles such as pails, tubs, etc., with rims, bands, and seams for the flux to lodge in.

Sintering Low-Grade Iron Ores To Conserve Resources

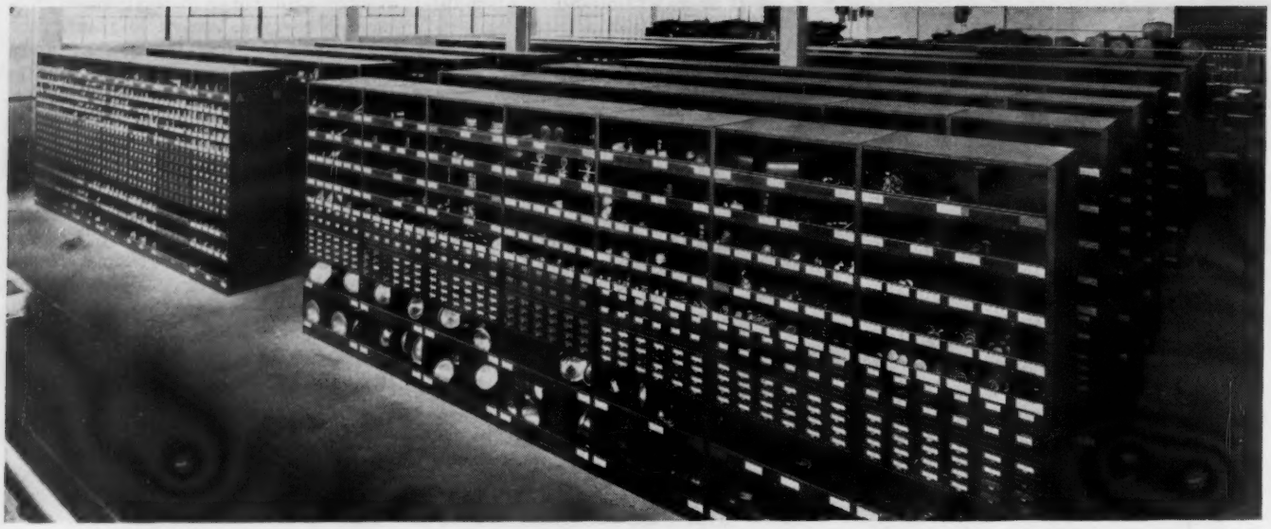
With gradual increasing consumption of iron ore as the steel industry makes further gains in operations, more importance will be attached to the conservation of iron ore reserves by sintering of low-grade ores, for the past few years considered uneconomical.

An article in the February issue of *Compressed Air Magazine* describes a modern sintering plant and how it is operated. Sintering is essentially a roasting process by which iron-bearing ores in powdery form or of high moisture content are agglomerated into a mass of pure iron, cellular in structure and in form exactly suited to blast-furnace use.



Photo, courtesy National Petroleum News

MOVING STEEL BUBBLE TOWER IS NO LIGHT OCCUPATION: The tower, 15 feet in diameter and 83 feet long, was fabricated by the Sun Shipbuilding & Dry Dock Co., at Chester, Pa., and transported to the Sun Oil Co.'s refinery at Marcus Hook, Pa., to be used for fractionating gasoline. A special cradle was welded directly to the tower shell, and to the cradle was welded a draw-bar coupling. To the cradle were attached freight car trucks. All other traffic on the railroad between the two cities was suspended; tracks at some locations had to be moved—the first time a tower of such size ever has been shipped in assembled form

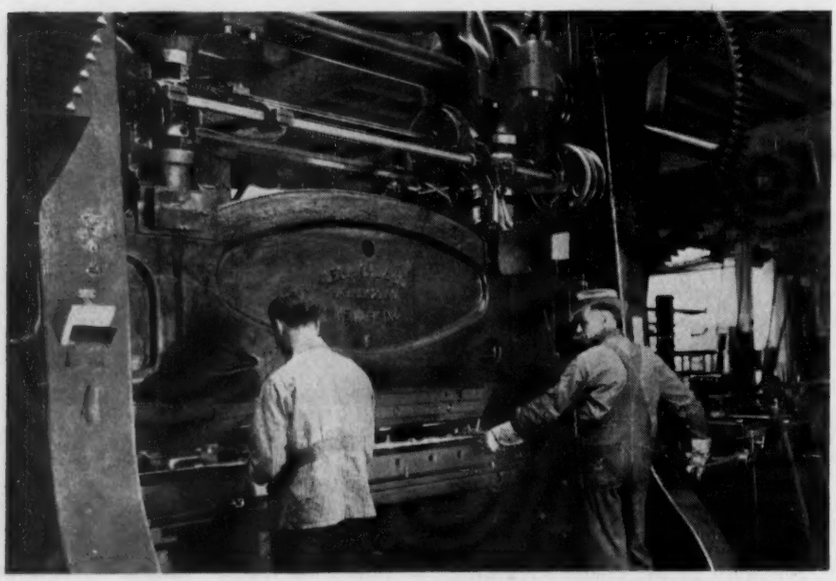


A typical installation of commercial shelving, in this case used for automobile parts

Forming, Welding and Finishing Sheets in Manufacture of Commercial Shelving

STRAIGHT-LINE production methods facilitate operations of Lyon Metal Products Inc., Aurora, Ill., large manufacturer of steel shelving, store fixtures, lockers and card tables and chairs. Although dissimilar in application, the company's principal products of shelving, fixtures and lockers, have a certain relationship in the steel materials from which they are fabricated as well as in the various fabricating processes they undergo. This necessitates only minor adjustments to production facilities when changing the schedule of parts going through the plant from one type of product to another.

Manufacture of all products is not carried on simultaneously. A schedule of a certain number of units of shelving, for example, is initiated and moves through the different manufacturing operations in one group before the next schedule, possibly covering a different product, is commenced. From the raw steel to the paint shop, parts in process move in a straight line.



A 200-ton press brake used for sharp forming operations. This is adapted to handle sections up to 120 inches long, such as fixture molding, lable holders and the like

Commercial shelving, used in many industries for the storage of parts and products, is made principally of 18 to 24-gage cold-rolled steel sheets and tee bars, the latter being used in fabricating the upright members. Steel sheets for the shelves first are sheared to size and squared on squaring shears. The corners then are notched on a horn press and the ends punched with a slot hole. In order to permit dividers to be placed in the shelves, divider holes next are punched in the sheet, this being done on a 48-inch press. Dividers are adjustable on 3-inch centers and are made in sizes to fit the full height of shelf opening.

Hems Give Reinforcement

To provide reinforcement to the shelf, the sheet is hemmed on all four edges, the flanges being formed around 10 gage-steel bands, 1 x ⅛-inch, which continue completely across the entire front and back, and around each corner, extending several inches along the side. Uprights to support the shelves are made either open with two tees alone or closed by a partition sheet. The tees are sheared to length in a bull shear, ground on the bottoms and straightened. Side sheets are sheared to size and offset along the edges that are to be affixed to the tees.

Spot welding is employed to secure the partition sheets, care being taken to insure that the two tees remain parallel and square. Tees then are punched to receive bolts fastening special clips which are designed to hold

the shelves in place. These clips are stamped from 11-gage steel strip and are of the compression type, gripping the shelf at each corner when the unit is assembled. After the uprights and shelves are inspected, they are moved to the paint shop. Shelving is shipped disassembled, being erected at its destination by bolting clips to the uprights and forcing the shelving in.

The painting department of the Lyon plant is of modern design, and is capable of accommodating a large number of pieces quickly with a minimum of manual handling. Objectionable fumes are kept at a minimum by an effective system of forced ventilation. Most products are given a coating of baked enamel, although a number, including locker doors, are lacquered, and complete equipment for the latter type of finishing in any of 65 different colors is available. Enameling equipment consists of two automatic dippers and ovens for handling small parts and five tanks with accompanying oven for finishing pieces ranging up to 42 x 120 inches in size.

As shown, pieces are attached to trolleys which are moved by a chain drive on an overhead rail, the latter inclining over the tank and permitting the work to be submerged. After dipping the trolleys travel slowly to the ovens, allowing excess enamel to drain before the baking commences. Larger pieces also are hung on trolleys which are moved on overhead rails over the dipping tanks where a hydraulically operated plunger lowers the work into the enamel. Baking time and oven temperatures vary, depending on the color, the average being about one hour at a temperature of 200 to 450 degrees Fahr.

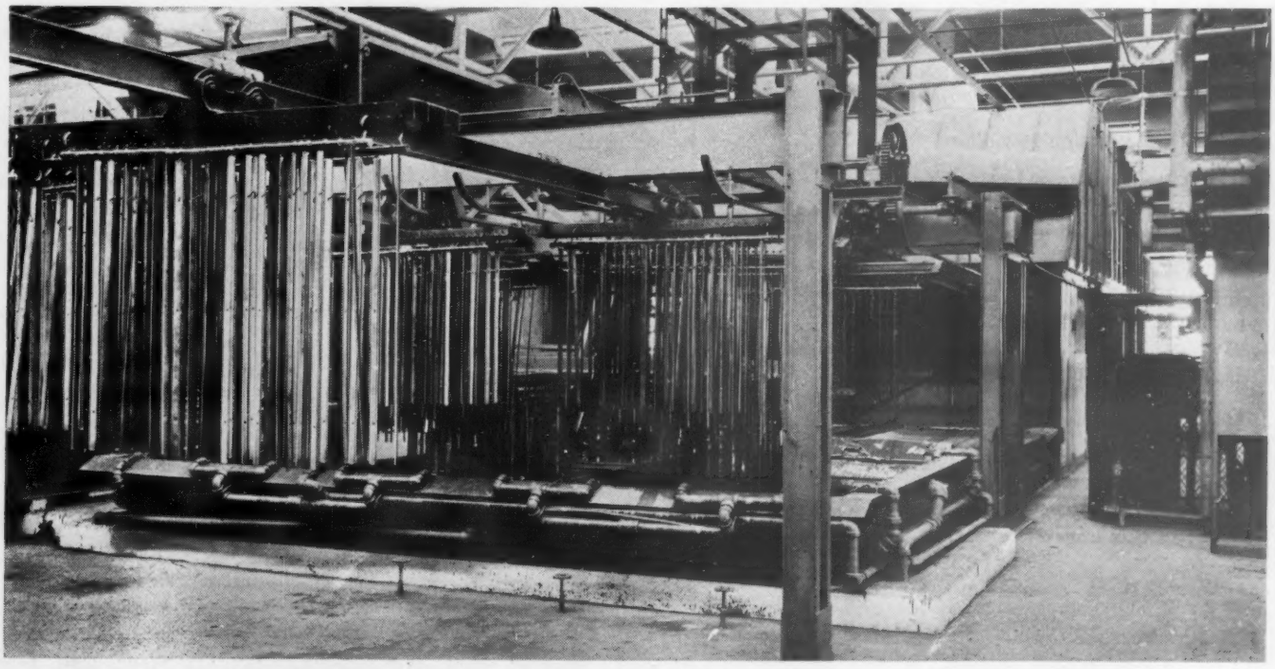
Standard shelving differs somewhat from the commercial type in design and method of fabrication. Instead of employing tees for the uprights, standard shelving makes use of members formed by doubling a section of 11-gage flat-rolled steel and having a tubular shape on the outside edge. When a closed upright is desired, a partition sheet is riveted between two vertical members. Shelves are notched to fit snugly against the side of the uprights but are supported by horizontal tie rods at the front and back instead of by clips.

Spot welding tees to partition sheets for uprights of commercial shelving

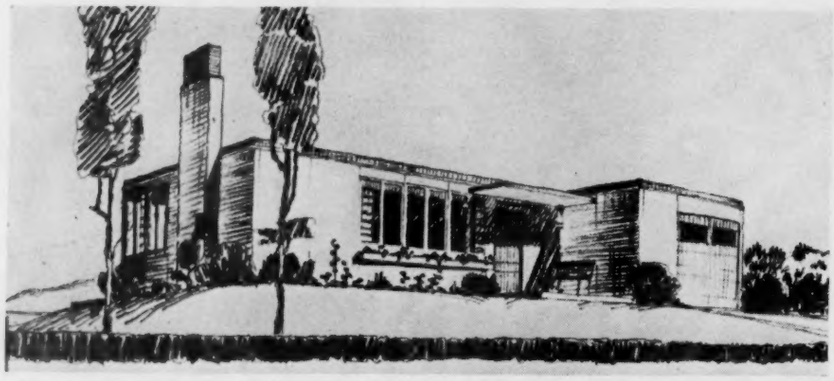
Heavy Forming Equipment

Fabrication of the various types of shelving and store fixtures involves sharp forming operations in many instances. For the larger pieces a 200-ton press brake shown in an accompanying illustration is employed. This machine handles sections up to 120 inches long.

Oxyacetylene or electric welding also is involved in making tables, store counters and lockers, as well as shelving. Locker frames are fabricated from angles which are arc welded together, the upright members forming the front legs which are fitted with adjustable floor plates. Locker doors are formed from 16 or 20-gage cold-rolled steel sheets, the ends of which are folded back along both inside edges, while each vertical edge is formed into tubular V-shaped reinforcements. This stiffening process is omitted where a semiflexible door is desired. Sides and backs of lockers are flanged to give a double thickness of steel at all corners.



Lable holders being given enamel coating in automatic dipper. Ovens are shown in background



Architect's drawing of five-room steel residence developed by General Houses Inc. for exhibition at "A Century of Progress," 1934

Five-Room Residence Is 90 Per Cent Rolled Steel

STEEL as a material especially suited to the building of modern homes again will be demonstrated in the housing group at "A Century of Progress" which opens at Chicago, May 26. Several new structures involving steel construction will be on display, one of the most interesting of which is expected to be that of General Houses Inc., Chicago, pioneer developer of prefabricated steel panel dwellings.

This company is to present "The House of Steel," a five-room residence with attached garage, essentially like the house it showed last year but embodying a new design which makes use of steel to a greater extent than ever before. It is offered as an answer to the immediate needs of the market in the moderate price field under $8000.

Flexible Design Permitted

The house consists of two bedrooms, a living room, dining alcove and kitchen. Garage and house entrance open into a hall between the living room and a passage leading to the bedrooms. Retaining the panel method of construction with its advantage in permitting wide variations of room arrangement and general flexibility of plan, the use of steel is increased further in the new design by the inclusion of this material for some of the interior walls and partitions, studs and ceilings. The fireplace also is fabricated of steel sheets. Total weight of steel in this house is about 25,000 pounds.

Different types of standard interchangeable wall panels in addition to the plain wall section are illustrated in the accompanying sketch. With these standard sections it is possible to obtain a variety of arrangements for the different rooms.

Exterior panels are fabricated of 14-gage copper-bearing steel sheets and are 4 feet wide and 7 feet 10 inches high. U-shaped flanges are formed on the side edges of the sheets to provide stiffness to the sections and to permit the bolting together of the panels. A socket wrench is the only tool necessary in the erection of this type of house, the panels being fabricated and ready for assembly when delivered to the building site. Plastic is placed between adjacent panels to make the joints water-tight, and the sections then are bolted together.

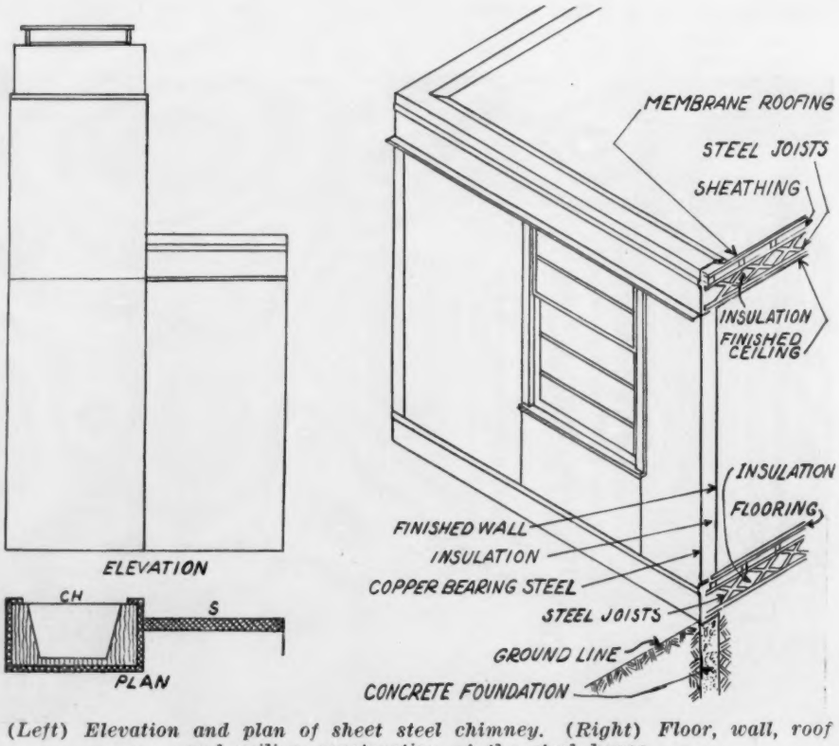
Rock wool insulation is employed between the exterior and interior panels and also in the floor and ceiling joists, all sections having 3-4 inches of insulation. Eight-inch expanded steel joists rest on the concrete foundation and are spaced over the floor area, giving the structure a steel-decked subflooring. Floors are wood as also are the window sashes and frames. Steel joists form the roof support, with a membrane roofing laid over sheathing which is placed above the joists. Coping also is fabricated from 14-gage copper-bearing sheets and extends downward to seal edges of the roofing.

Interior walls are 7 feet 6 inches high and are made of 20-gage steel

Sixth in Steel House Series

THE house described in the accompanying article is the latest in a series of several low-priced residences developed by General Houses Inc. A small house built by this company was described on page 21 of the April 3, 1933, issue of STEEL.

Other types of steel houses have been reviewed in recent issues of STEEL *as follows: April 2, Page 30; April 9, Page 37; April 16, Page 30; April 23, Page 28; and May 14, Page 30.*



(Left) Elevation and plan of sheet steel chimney. (Right) Floor, wall, roof and ceiling construction of the steel house

TESTED AND APPROVED

by HELTZEL
Steel Form & Iron Co.
for its wide welding range

This heavy 250 H. P. transmission case was fabricated entirely with a P&H-Hansen 400 Ampere Arc Welder using shielded arc electrodes.

"The wide welding range of our 400 Amp. P&H-Hansen Arc Welder," says Mr. Jim Murray, Heltzel superintendent, "provides ample flexibility in this weldery where the work varies from 12-gauge gear guards to heavy plate construction".

NRA MEMBER U.S. WE DO OUR PART

It will handle Your Job, Too

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

Please send me data indicating how the P&H-Hansen Arc Welder meets every modern requirement for a high efficiency, low cost welder.

Signed.....

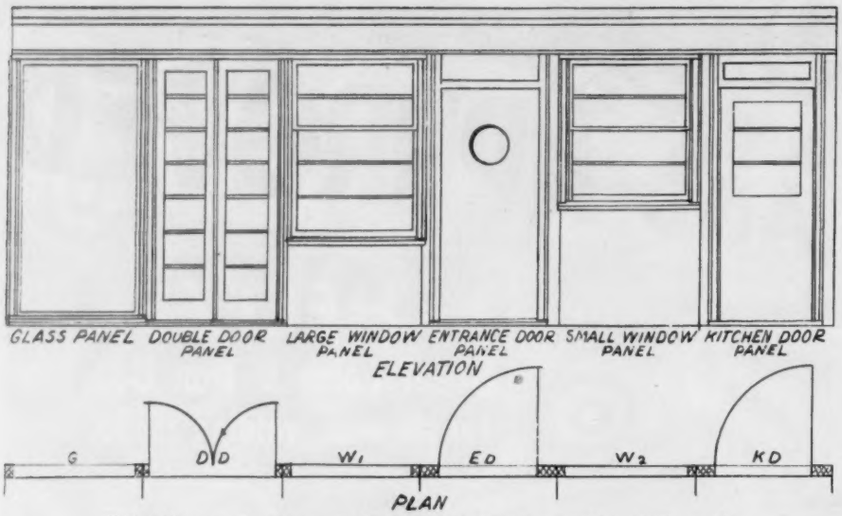
Address.....

City.....*State*.....

Ask the men who use 'em—they'll tell you to buy and stick to

P&H-HANSEN ARC WELDERS

BACKED BY 50 YEARS OF EXPERIENCE



Elevation and plan of standard interchangeable wall units

sheets. Both interior and exterior walls are painted. Batten strips ¾-inch wide are placed over the joints between interior wall panels.

Besides the house itself, General Houses Inc. also will display a group of full-sized model section demonstrating the essentials of steel house construction and showing the progress that has been made in the utilization of this material for home building. This exhibit of model sections will be placed in the museum of science and industry at the conclusion of the fair as a permanent unit of the museum's collection of architectural subjects.

New Steel Houses at "A Century of Progress"

IN ADDITION to the house described herein, new homes to be added to the housing group at "A Century of Progress" this year include one by the Stran-Steel Corp., Detroit; a country home, employing a steel frame and prefabricated units, designed by George F. Keck, Chicago architect; a guest cottage, to be added to the garden of the Armco-Ferro Enamel house; and a steel-paneled house sponsored by the Universal House Corp., Zanesville, O. Design employed by the Universal corporation was described in STEEL *for April 2.*

Choosing Coatings To Preserve Metal

DECLARING that the use of metallic protective coatings as a guard against corrosion of ferrous materials must be governed by the type of atmosphere to be encountered in service, H. S. Rawdon, chief of metallurgical division, national bureau of standards, Washington, surveyed the entire subject of metallic coatings in an address before the Detroit chapter of the American Society for Metals, May 14. Over 200 attended the gathering, the last of the current season for this motor city group.

Use of metallic coatings dates back into the early pages of history, one of the first discovered methods being the application of gold foil over metallic objects for purposes of ornamentation. This was practiced by the early Egyptians and numerous relics of their art in this field have been unearthed by archaeologists.

Six general methods for applying metallic coatings to ferrous materials may be listed, Mr. Rawdon pointed out. These include the mechanical method, hot dipping, electrodeposition from aqueous solution, surface alloying, metal spraying, and a pseudo-metallic coating arrangement in which the surface is converted chemically into a corrosion resistant material, such as in bonderizing or any of the similar surfacing treatments. Of these six groups, Mr. Rawdon stated that all are comparatively old and have been known in one form or another for years, with the exception of metal spraying which he considered a recent development.

Practical applications of these six methods of protection against corrosion in industrial materials were cited, and advantages of many of the currently used processes, such as galvanizing, calorizing, sherardizing, electroplating and the like, were enumerated.

In evaluating the worth of a metallic protective coating, much work has been done in the development of laboratory corrosion tests of an accelerated nature which will furnish some indication of the relative merits of the different protective methods. Salt spray tests have been devised and found to give excellent indication of nonuniformity in coatings. However, they do not give a true measure of service value.

Intermittent immersion tests give further measure of the behavior of coatings but, according to Mr. Rawdon, cannot approach in value the data being obtained from outdoor corrosion tests actively sponsored by a number of technical groups, including the American Society for Testing Materials. A committee of the latter organization is now conducting tests on a wide variety of protective coatings at seven locations throughout the country—State College, Pa.; Key West, Fla.; Sandy Hook, N. J.; Altoona, Pa.; Rochester, N. Y.; New York; and Pittsburgh. Atmospheres in these locations range all the way from the comparatively pure, rural air around State College, Pa., to the smoke-laden sulphurous conditions in the vicinity of Altoona.

By carefully noting the deterioration of coatings over a period of years in these various localities—the tests have now been going on for eight years—much valuable information will be available to assist in the proper selection of a coating for use in a particular atmosphere. Results so far seem to point to the value of the hot-dipped galvanized coating for long life under adverse atmosphere conditions.

Makes Nonsparking Tools From Beryllium Copper

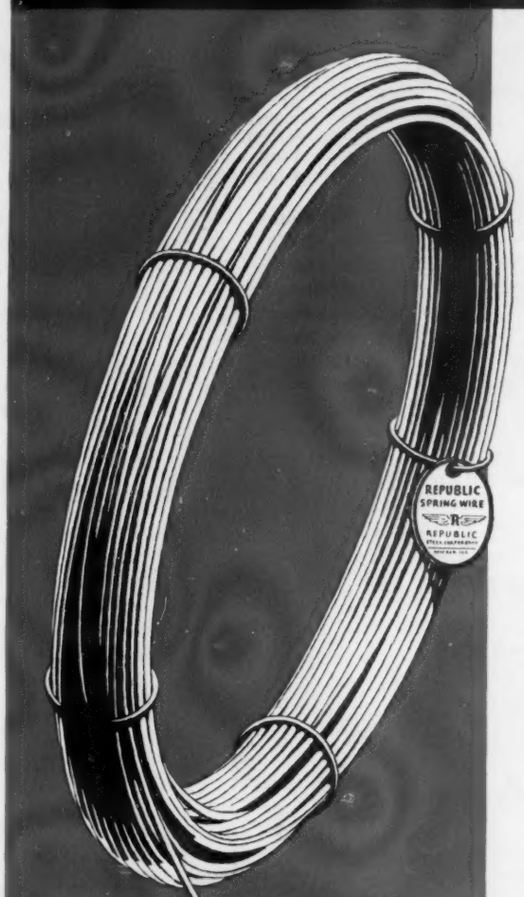
To meet the demand for nonsparking tools, possessing extremely durable physical properties, for use particularly by manufacturers and handlers of inflammable and explosive compounds, Stanley Tools, New Britain, Conn., is placing on the market a line of such tools made from the new Anaconda alloy, beryllium copper.

This alloy, which is over 97 per cent pure copper, can be hardened, toughened and strengthened by working and heat treating to give it exceedingly high physical qualities. Beryllium copper is nonmagnetic and will not give off sparks when struck against other metals or materials. It is immune to rust and highly resistant to a wide variety of corrosive agents.

This unusual combination of properties is said to make the alloy an ideal material for safety tools which must be extremely durable. Edged tools of this metal possess a long life and will cut tough steel parts without injury to themselves.

The new nonsparking tools are made from wrought and heat treated metal, which provides them with much greater strength and toughness than tools made from cast metal. The selection includes hammers, chisels, scrapers, sledges, pinch bars, screw drivers, picks, wedges, fork tips and other items.

REPUBLIC *spring wire*



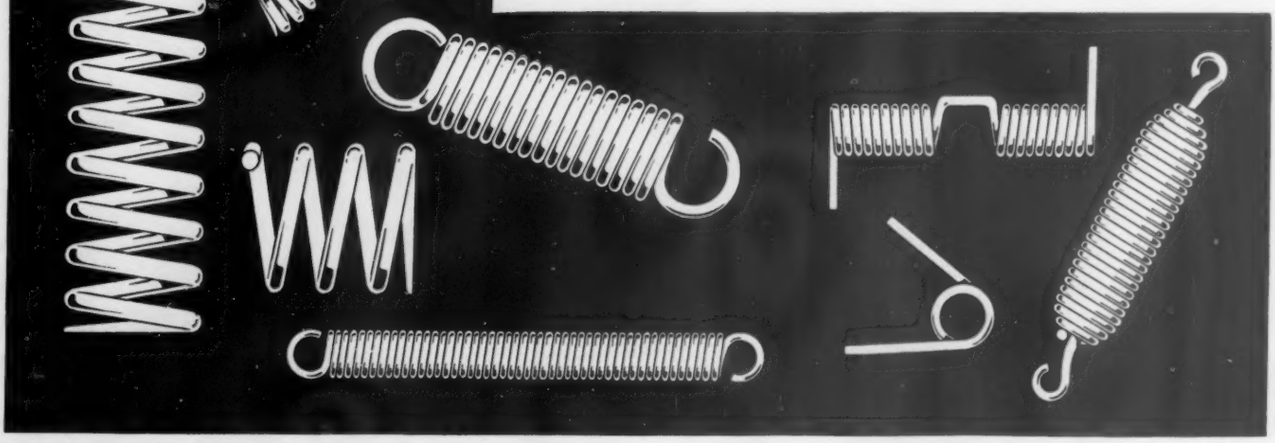
Many manufacturers have found by experience that Republic Spring Wire cuts manufacturing costs, lowers spoilage and improves the quality of the fabricated product. It is ideal for the manufacture of upholstery springs for furniture and automobiles, and for many mechanical spring applications.

It is furnished to suit each customer's requirements of tensile strength and temper, and finished to fit the work for which it is intended. It is made in 7 to 19 gauge in various sized coils, depending on the gauge.

Outline your requirements and Republic will make recommendations that may save you money or increase the saleability of your product. Write the nearest Republic Sales Office for details.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO



Properties of

Cromansil Steels for Structural Purposes

BY W. B. MILLER

Union Carbide & Carbon Research Laboratories Inc.

MODERN developments in design and construction of steel structures require a relatively low cost steel of high strength and toughness. Such a steel should have a yield point of 50-60,000 pounds per square inch, an ultimate strength of 80-95,000 pounds per square inch and an elongation in 8 inches of 16-20 per cent. It should be weldable and show a minimum of air hardening when cooled normally from welding temperatures. The steel should also lend itself to the various shop and fabricating operations of punching, shearing, bending, reaming, threading, and riveting.

The necessary physical properties can be obtained with several alloying elements, but the increased cost is too great in most cases to make them attractive to the trade in general. However, we believe that Cromansil steels fill this need and afford the best high strength structural steel on the market, particularly for many types of welded construction.

A paper presented at the annual meeting of the American Institute of Steel Construction Inc., Chicago, Oct. 19-21, 1933. The author, W. B. Miller, is consulting engineer, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.

As the name implies, Cromansil steels derive their superior physical properties from the elements chromium, manganese and silicon together with varying carbon contents depending on the physical properties desired and the intended use of the steel. While for special applications somewhat different ranges are specified, the more useful compositions will fall within the following range of alloy metal content:

Chromium, 0.4 to 0.6; manganese, 0.9 to 1.2; and silicon, 0.7 to 0.9 per cent. The carbon content can be varied widely, the amount depending on the use to be made of the steel. The following carbon range is indicated for some typical applications:

	Per cent
Staybolts	not over 0.10
Rivets	not over 0.20
Boilers, pressure vessels, structural	not over 0.15-0.22
High strength seamless tubing	0.30-0.35
Heat treated parts	0.35-0.65

No doubt the question comes to mind, "Why are the three alloying elements used, when it is known that other structural steels containing one or combinations of two of these elements have been used?" A few words as to the reason for these alloying elements will probably explain, at least partly, the superior physical properties to be described later.

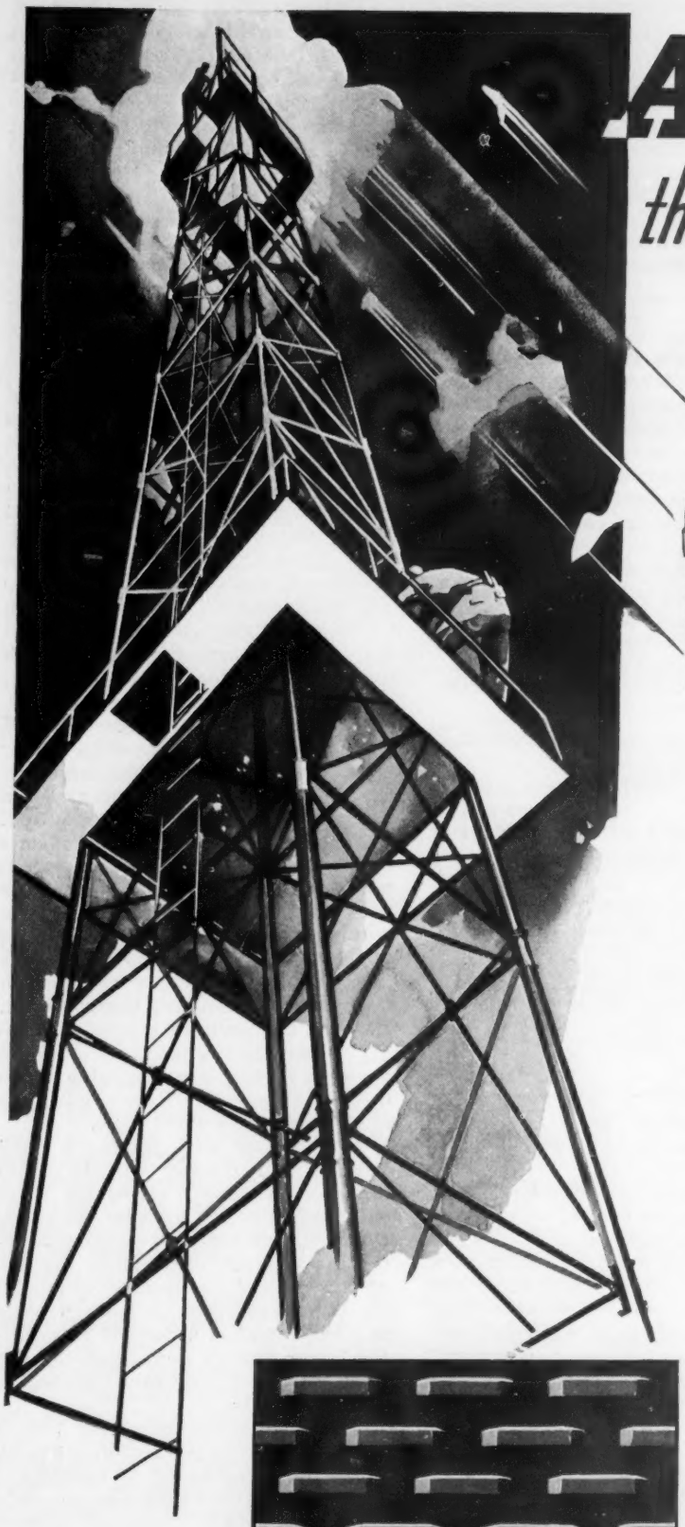
Silicon contributes toward increasing the yield point without any detrimental effect on ductility or machinability. Silicon also tends toward increased strength, but this is better brought about by manganese. The manganese-silicon combination is extensively used in the form of the well known silicomanganese steels. The

Table I

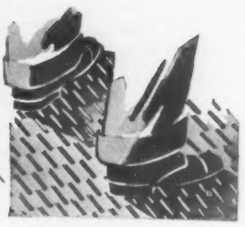
Physical Properties of Typical Cromansil Steels

Type of Material	Analysis, per cent C	Cr	Mn	Si	Condition	Yield Point, Thousands of lbs. per sq. in.	Ultimate strength, Thousands of lbs. per sq. in.	Elongation, per cent in 8 inches	Reduction in area, per cent	Izod, ft.-lbs.	Brinell
Staybolts (1-in. round)	0.05	0.25	1.12	0.87	As-rolled	54	71	31	75	64	125-135
Boiler Plate	0.21	0.47	1.17	0.72							
½-in. plate											
Longitudinal	.....	.....	.....	.....	As-rolled	50	92	20	56	36	200-220
Transverse	.....	.....	.....	.....	As-rolled	51	91	18	54	....	.....
1-in. plate											
Longitudinal	.....	.....	.....	.....	As-rolled	51	99	16	....	....	200-220
Transverse	.....	.....	.....	.....	As-rolled	51	98	14	....	25	.....
1½-in. plate											
Longitudinal	.....	.....	.....	.....	As-rolled	56	89	19	....	....	200-220
Transverse	.....	.....	.....	.....	As-rolled	53	89	17	....	24	.....
2-in. plate											
Longitudinal	.....	.....	.....	.....	As-rolled	53	86	20	....	....	200-220
Transverse	.....	.....	.....	.....	As-rolled	54	88	15	....	20	.....
½-in. plate	0.21	0.51	1.09	0.64	Normalized	53	94	20	....	....	200-220
⅜-in. plate	0.22	0.43	1.15	0.87	Normalized	74	105	29*	50	32	210-230
Structural Shapes											
2 x 2-inch bar	0.32	0.46	1.07	0.44	As-rolled						
Center	.....	.....	.....	.....	.....	65	99	27*	64	....	200-220
Edge	.....	.....	.....	.....	.....	68	107	25*	62	....	.....
⅜-in. plate	0.31	0.42	1.13	0.87	As-rolled	72	119	23*	....	42	225-245
⅜-in. plate											
Longitudinal	0.46	0.67	1.19	0.82	As-rolled	88	142	20*	....	....	265-285
Transverse	.....	.....	.....	.....	As-rolled	91	143	19*	....	20	.....
Longitudinal	.....	.....	.....	.....	Normalized	100	148	20*	....	....	.....
Transverse	.....	.....	.....	.....	Normalized	101	140	20*	....	23	.....

*Results marked (*) are per cent in 2 inches.



A TREAD
that makes the crow's nest
SAFE



The foot that slips is a source of danger so common that everyone recognizes it without argument. If statistics were needed to prove the danger, they are unhappily abundant and appalling. What to do about it is the question. • On elevated platforms and bridges, industrial flooring, sidewalk doors and openings, boiler-room stairs, and a wide range of other uses, Carnegie Floor Plate affords the proper protection. Its improved raised-pattern surface gives secure contact to the foot, makes walking easy and comfortable, and promotes efficiency as well as safety. Carnegie Floor Plate drains and cleans easily. It is rolled in different widths and thicknesses to suit every requirement. • Your workmen rightly expect safe working conditions. Include Carnegie Floor Plate in your safety program.

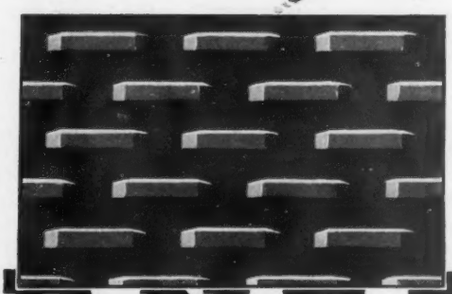
•

CARNEGIE STEEL COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH · PA.

260



CARNEGIE
FLOOR PLATE

Table II

Results of Welds in 0.20 Carbon Cromansil Steel

	Weld Position		
	Flat	Vertical	Overhead
Yield point, lbs./sq. in.	58,000-63,000	56,000-61,000	56,000-61,000
Ult. strength, lbs./sq. in.	86,000-98,000	86,000-96,000	86,000-92,000
Per cent bend elongation	20-35	20-30	20-30
Brinell hardness—plate	.....	180-200	.....
Brinell—heat affected zone	.....	230 max.	.....
Brinell—weld metal	.....	260 max.	.....

addition of small amounts of chromium to the silicon-manganese combination results in further benefits, particularly that of depth hardening. This property is highly essential and results in more uniform properties throughout heavy masses. For instance, in 2-inch thick plate, the presence of chromium prevents any discrepancy between properties at the surface and center of the section. It also produces greater strength, proportional ductility, and renders the steel more amenable to heat treatment.

Ductility with High Strength

Thus Cromansil steels when compared with manganese steels of the same carbon content and ultimate strength will be found to possess greater ductility. This feature obtained with chromium is more pronounced in compositions having an ultimate strength around 100,000 pounds per square inch in the as-rolled or normalized condition. In other words, for a given ductility in a steel of high ultimate strength, Cromansil steels have superior tensile properties. Another advantage of the Cr-Mn-Si combination is that it allows greater latitude in the finishing temperature in hot rolling. With chomium present improvement in both the yield point and ultimate strength as well as superior impact strength and elongation are obtained without expensive or drastic heat treatment. Thus with the proper combination of the three alloying elements chromium, manganese, and silicon, the essential properties for any engineering steel can be obtained most economically.

The physical properties of typical Cromansil steels are summarized in Table I.

In summing up the properties of Cromansil steels we may state (1) that Cromansil steels afford the maximum benefit of alloy content at a lower cost than any other alloy combination so far marketed; (2) the benefits are usually derived when material is in the as-rolled condition; (3) the transverse and shearing strengths are very high for any tensile strength; (4) desired properties may be obtained without heat treatment by selection of appropriate alloy and carbon percentages; (5) Cromansil steels greatly extend the tensile ranges for certain structural requirements at reasonable costs without proportionate sacrifice of ductility; (6) the fatigue limit of Cromansil steels is about 60 per cent of the ultimate strength. (Cromansil staybolts with an ultimate strength of 68,000 pounds per square inch have a fatigue limit of 42,000 pounds per square inch); (7) by comparatively simple heat treatment Cromnasil steel has a better combination of strength and ductility than any form of carbon steel. With tensile strengths around 140,000 pounds per square inch these steels have an impact value of from 14 to 22 foot-pounds, Izod.

Table III

Shear Tests of Cromansil

	Tensile values		Shear value
	Yield point, lbs./sq. in.	Ult. strength, lbs./sq. in.	Shear strength, lbs./sq. in.
SN 7....	58,500	75,200	56,400
	59,200	75,200	57,500
SN 8....	61,000	88,000	63,200
	59,300	87,900	69,000

The manufacture of Cromansil steel requires no special or unusual metallurgical procedure. It can be made readily in the open hearth at a nominal increase in cost over carbon steel. From experience we know that Cromansil steel rolls well and can be fabricated into any structural shape. Forging is easily done and no fundamental change from carbon steel practice is required. An instance of its easy workability is the piercing and drawing of billets to seamless tubing.

Although these steels are extensively used in the as-rolled condition they lend themselves to inexpensive heat treatment on account of their excellent normalizing characteristics.

Fabrication of structures and working with all ordinary shop tools including threading and welding equipment are not essentially different with Cromansil than with ordinary carbon steel. These operations require no extra tooling and can be carried out with no increase in cost over that required for carbon steel. One half-inch plate can be bent flat on itself without fracture. Local heating for hot bending does no damage to the structure. Hence the use of this steel by the designer does not involve any unusual shop practice or additional expense either in machining or fabrication. Wherever selection of Cromansil is indicated the slight increase in cost is justified by the increased physical properties and no allowance need be made for increased fabricating cost.

Welding

The welding of plate, pipe, and other Cromansil shapes can be done with the usual equipment. The steels commonly used for welding will be the 0.10 and 0.20 per cent carbon grades of approximately 75,000 and 95,000 pounds per square inch ultimate strength respectively. These grades will contain chromium 0.4 to 0.6, manganese 0.9 to 1.2, and silicon 0.7 to 0.9 per cent. Both the 0.10 and 0.20 per cent carbon grades ⅜-inch thick can be welded by the oxyacetylene process with high strength rods, producing welds of plate strength and having bend elongations of 20-40 per cent. With heavier thicknesses in the 0.20 per cent carbon grade a special high strength rod is required. This is due to the fact that less benefit of the alloys in the plate is obtained in the heavier welds. Thus with good welding practice oxyacetylene welds with ultimate strengths of 75,000 to 95,000 pounds per square inch can be obtained depending on the grade of Cromansil being welded. If welds are made in grades containing more than approximately 0.20 per cent carbon, a normalizing treatment is necessary to insure adequate ductility in the welded joint.

Arc welding with its more rapid heating and cooling will be more liable to produce a slight air hardening effect in the high tensile steels than will oxyacetylene welding. However, this is no obstacle to the use of arc welded Cromansil structures for the reason that in modern practice the metal is deposited in multiple layers and an annealing effect is thus obtained on each preceding layer or layers.

Cromansil steels containing 0.10 to 0.20 per cent of carbon and having ultimate strengths of 75,000-95,000 pounds per square inch may be readily welded by the metal arc process using any one of a number of the commercial high strength electrodes. With the 0.10 per cent carbon grade no difficulty is experienced in developing plate strength in any thickness. Bend elongations will be over 30 per cent. With the 0.20 per cent carbon grade having a tensile of around 95,000 pounds per square inch, it is quite natural that an alloy steel of this strength will harden to a certain extent if cooled too rapidly from

temperatures above the critical. For this reason when making single vee-butt welds in material of this strength, the welds should not be backed up by any sort of chill plate, it being preferable to weld to a steel backing up strip. In welding material ⅜-inch thick or heavier the building up of the weld in multiple layers or beads affords an annealing effect as above mentioned.

With 60-degree single-vee welds in thickness up to ½-inch, satisfactory welds are obtained with any one of a number of the commercial high strength electrodes. However, with a 60-degree single-vee weld in ¾-inch thick or heavier material there is a decided drop in tensile strength. This is explained by the fact that in material of this thickness, the 60-degree single-vee weld is too wide at the top to obtain sufficient incorporation of plate metal in the weld to insure adequate strength. In order to obtain plate strength in single-vee welds in material ¾-inch or more thick, electrodes producing higher strength welds are required. Excellent results have been obtained using coated Cromansil electrodes of the low carbon staybolt composition. With these combinations, weld strengths of over 90,000 pounds per square inch are obtained, together with bend ductilities of over 18 per cent. Tests of single 60-degree vee butt welds in 1 inch thick plate using commercial high strength electrodes and coated Cromansil electrodes gave the following results:

Electrode	Ult. strength lbs./sq. in.
Commercial	71,000
Commercial	70,250
Cromansil	92,500

However, by changing the design of the gap, quite satisfactory results can be obtained with the commercial electrodes. Either the straight side gap with a bottom plate or the U-shaped gap with straight or slightly tapered sides will afford sufficient plate melting to yield welds with plate strength.

In fusion welding any steel with tensile strength over 85,000 pounds per square inch, it is natural to inquire as to the heat effect of the base metal. Hardness explorations completely across the weld zone of a weld in ¾-inch plate made with Cromansil electrode showed that a maximum increase in hardness of about 30 brinell occurred in the plate immediately adjacent to the weld metal and at the surface. Hardness measurements on cross sections of multiple layer welds showed an increase of approximately 10 points brinell. In either case the increase in hardness to a maximum of 217 brinell was of no consequence for none of the bend samples failed in the heat affected zone.

It is common practice to stress relieve many welded complicated structures such as machine bases, etc. This procedure is usually carried out at temperatures around 1200 degrees Fahr. Such a treatment has no effect on the properties of the Cromansil plate outside the heat affected weld zone. However, it does remove the small hardening effect at the edge of an arc weld in Cromansil containing 0.20 per cent or more carbon. To refine the grain of the welded zone in Cromansil steel it is necessary to normalize at temperatures around 1650 degrees Fahr. Such treatment is required only for structures subjected to heavy stresses where the maximum properties available must be realized.

Table II summarizes the results obtainable in welds in 0.20 per cent carbon Cromansil steel, depending on thickness of material, design of joint, and choice of electrode, the higher strengths being realized with alloy steel electrodes.

The minimum ductility obtained in any case is higher than that realized in most steel structures welded with bare electrodes and which are performing quite satisfactorily.

Flame Cutting

Cromansil steels are readily cut with the oxyacetylene cutting torch leaving exceptionally clean surfaces and smooth corners. It is well known that flame cutting of most high strength steels usually results in a surface hardening that is ordinarily prevented by preheating to a black heat before cutting. Tests indicate that Cromansil steel is less susceptible to this hardening effect than other steels of like physical properties. Likewise it does not seem to have pronounced hardening properties during welding. The writer believes that this lesser susceptibility to skin hardening is due to the low heat conductivity of Cromansil steel—about one third that of ordinary boiler plate. The relatively low carbon content in Cromansil is also factor. This property works to good advantage during welding and flame cutting in that the cold base metal cannot extract heat fast enough to produce the maximum hardening effect as in other steels.

Riveting

In order to take advantage of the high strength of Cromansil steels in riveted structures a high tensile rivet is required that will lend itself to all the usual operations. Such a rivet has been developed in the Union Carbide and Carbon Research Laboratories and consists of a low carbon Cromansil steel of exceptional strength and ductility. Through the courtesy of A. E. Gibson, vice president, Wellman Engineering Co., Cleveland, we have obtained some exceedingly interesting data on rivet tests in Cromansil steel using Cromansil rivets. The tests were carried out on 0.22 per cent carbon Cromansil having an elastic limit of 63,000 pounds per square inch, and an ultimate strength of 92,000 pounds per square inch. Two types of rivets were used; viz., 0.10 carbon and 0.19 per cent carbon, having the following physical properties:

	Type SN 7	Type SN 8
Carbon, %	0.105	0.19
Silicon, %	0.68	0.60
Manganese, %	1.17	1.10
Chromium, %	0.38	0.30
Elastic limit, lbs./sq. in.	68,000	72,500
Tensile strength, lbs./sq. in.	77,000	89,500
Elongation in 2 in., %	37	32
Reduction of area, %	77	71.4
Hardness, Brinell	151	163

Tests on ¾-inch single rivets in single and double shear gave the following values:

	Shearing Load—pounds	lbs./sq. in.
Single shear:		
SN 7 (ave. 5 tests)	40,400	78,000
SN 8 (ave. 4 tests)	54,500	105,100
Double shear:		
SN 7 (ave. 5 tests)	76,300	73,600
SN 8 (ave. 5 tests)	100,100	97,100

Pure shear tests were carried out on a driven and an undriven rivet of SN8 showing 63,620 pounds per square inch for undriven, and 112,200 pounds per square inch for driven rivet.

Tensile tests on driven rivets showed ultimate strengths of over 124,000 for the SN7 and over 135,000 pounds per square inch for the SN8 type.

From the foregoing it is seen that a remarkable increase in strength from 77,000 to over 135,000 pounds per square inch has resulted from the heating of the rivet, the quick cooling from contact with cold metal and the working of the steel in the riveting operation.

No Brittleness Developed

This excellent experimental work by Mr. Gibson, which was discussed extensively in the Oct. 2, 1933, issue of STEEL, leaves no doubt as to the value of Cromansil steel for high tensile rivet stock. Furthermore, Cromansil rivets do not develop the brittleness so often encountered with the high manganese rivet and may be readily chipped where flat head rivets flush with the plate are desired.

Pure shear tests, made in the Union Carbide and Carbon Research Laboratories on the SN7 and SN8 compositions gave the values shown in Table III. The ¾-inch round bars were machined to ½-inch round to conform to the capacity of the testing machine.

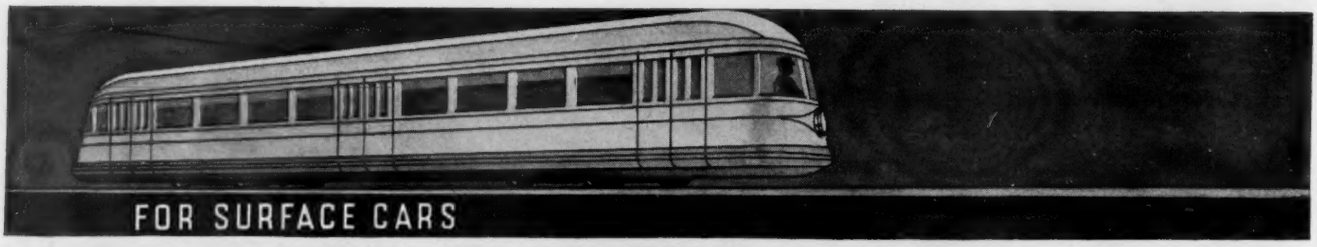
From these data it would appear that the yield point in the tensile test for practical purposes may be taken as a measure of the pure shear value of Cromansil rivet stock. However, these values are greatly increased by the riveting operation as mentioned before.

Another very interesting test of

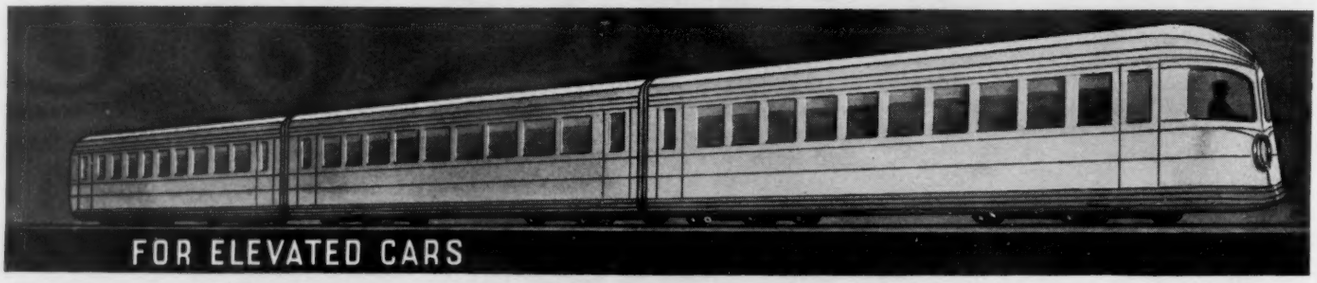
(*Please turn to Page* 50)

now...light weight with h

USS HIGH



FOR SURFACE CARS



FOR ELEVATED CARS

FOR RAILWAY PASSENGER AND FREIGHT CARS

● Typical of the advanced construction possible with USS High Tensile Steels is the new "Presidents' Car" now under construction for the Electric Railway Presidents' Conference Committee of the American Transit Association. USS COR-TEN has been used throughout for the body of the car.

Illinois
208 SOUTH LASALLE
SUBSIDIARY OF UNITED

Also Manufactured by American Sheet & Tin Plate Company • American Steel &

high strength and moderate cost

TENSILE STEELS

USS Cor-Ten

● *a low Chromium Copper Silicon Steel with a corrosion resistance approximately 4 to 6 times that of ordinary open hearth steel.*

USS Man-Ten

● *a medium Manganese Steel of somewhat greater tensile strength but with a corrosion resistance not as high as Cor-Ten.*

● **USS High Tensile Steels represent a notable contribution to the car building industry. They permit material reductions in weight of rolling stock without decreases in strength and with a saving in ultimate cost of equipment and transportation. A review of the following condensed statement of physical properties will indicate the advances which have been made in the production of these steels. Data on ordinary Open Hearth Steel is included for comparison.**

	ORDINARY OPEN HEARTH	USS COR-TEN	USS MAN-TEN
YIELD POINT (Lb. / Sq. In.)	25 to 35,000	50 to 60,000	55 to 65,000
TENSILE STRENGTH (Lb. / Sq. In.)	50 to 60,000	65 to 75,000	85 to 95,000
ELONGATION (% in 2 in.)	34 to 25	28 to 23	25 to 20
WELDABILITY	Good	Good	Good

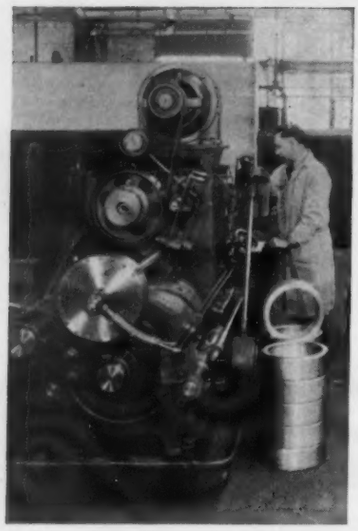
Write for additional information on USS High Tensile Steels

Steel Company
STREET, CHICAGO, ILLINOIS
STATES STEEL CORPORATION

USS High Tensile Steels are available in flat rolled products and light shapes

Wire Company • Carnegie Steel Company • Tennessee Coal, Iron & Railroad Company

Making the Most *of* METHODS AND MATERIALS



Drawing Stainless Requires Changes in Die Design

Although the generally accepted principles of die design apply equally well to dies for rustless steel, a number of important differences have been disclosed by experience. In drawing large blanks, for example, double draw beads sometimes are necessary to allow the metal to flow freely without using excessive pressure which would cause breakage. Again, the abrasive action of rustless steel is so severe that additional clearance space between the walls of the die and punch is required. A clearance of 0.007-inch above the thickness of metal itself seems best. Another variation of prime importance is that all working surfaces of drawing dies must be finished with a stone instead of an emery wheel; any slight inaccuracy or indentation of the surface will accelerate scratches and scoring of the die.

$ $ $

The lining of a furnace used in a steel forging plant was cast completely of refractory concrete with no joints. The arch in this furnace lasted almost twice as long as any other type of arch used previously.

$ $ $

Use Aluminum To Increase Length of Derrick Booms

Aluminum has replaced steel in derricks used on rivers in the Pittsburgh district. Vang Construction Co., Pittsburgh, recently placed a 100-foot aluminum boom on one of its river craft in building lock and dam No. 2 on the Allegheny river, replacing a 80-foot steel boom. On one of the Vang Construction Co.'s whirler derrick barges, a 65-foot aluminum boom has replaced a 50-foot steel boom. At St. Louis, Sternberg Dredging Co., St. Louis, recently installed a 275-foot aluminum boom in place of a 225-foot steel member on a large dredge. It is claimed that derrick booms can be lengthened considerable due to the reduction in weight by this substitution.

$ $ $

Anchor Bolts Slotted by Use of Cutting Torch

What appears to be a new use for the oxyacetylene torch was applied in connection with construction work at Boulder dam. It is for slotting anchor bolts. Former procedure was to mill these slots in the machine shop, average production being seven per hour. By using the cutting blowpipe a man can slot 30 per hour. The bolts are made of 1-inch diameter round stock 20 inches long with an eye in one end and the other end slotted through with 3/16-inch slot 3 inches long. When completed, they are galvanized. In use, a small wedge is put into the end of the slot and the bolt is driven into a drilled hole in concrete or rock; when the wedge reaches the bottom of the hole, it is forced up into the slot, spreading the bolt. The hole then is filled with concrete.

$ $ $

Strength of Sprayed Metal

Actual bond strength of sprayed metal varies from 200 to 700 pounds per square inch, depending upon the material being sprayed and the metal used. In some cases the bond strength can be increased materially by subsequent heat treatment, although in actual experience this has been found to be unnecessary. A sprayed coating has the texture and

STEEL FRAMING FOR PHOTOMURALS: Photographers called on the steel industry to help build what is claimed to be the world's largest photomural, a part of the exhibit of the Ford Motor Co. this summer at A Century of Progress in Chicago. Over 12 tons of steel angles was required to fabricate the 97 panels comprising the 600-foot mural. Frame sections are 19 feet 6 inches long and vary from 5 feet 3¾ inches to 8 feet 2 5/16 inches wide. Outside frame of these sections is of 3 x 2 x 5/16-inch angles, cross and longitudinal braces being 2 x 2 x ⅛-inch angles. Assembly was done by electric welding in the plant of Joseph T. Ryerson & Sons Inc. The mural will show 17 enlarged scenes in Ford plants and required over a mile of 20-inch photographic paper. Kaufmann & Fabry Co., Chicago, is the photographer

appearance of fine emery cloth and each succeeding coat will adhere to the preceding one with equal tenacity.

$ $ $

Cleaning of Materials Aids Welding and Enameling

Materials suitable for oxyacetylene welding and porcelain enameling should be free from segregated impurities and gas-forming elements for when the flame heats the steel to molten temperature these impurities expand rapidly, leaving porous spots and open craters or holes in the weld. Rough, honey-combed spots will be produced frequently by this condition, which, if not worked down, will show through numerous coats of enamel. The practice of cleaning sheets and blanks perfectly free from oil, drawing compound and other contamination before welding helps to correct this condition.

$ $ $

Use Steel for Oil Burners

Rolled steel in various forms is being used increasingly in the production of oil burner units, due not only to increasing application per unit but to the greater number of units being produced, particularly for domestic installation. To date, most installations have consisted of application of oil burners to standard heating units; however, an increasing number of complete heating units is being recorded, with several large companies of national reputation having entered the field as manufacturers in recent months.

$ $ $

Diesel Engine Is Crankless

From a mechanical design viewpoint, a recently developed crankless diesel engine is of considerable interest. Compact construction, obtained in part through the absence of crankshaft, camshaft, cylinder head, and other parts, adapts this engine to streamlined boat and vehicle application. Power generated by the pistons is transferred to inclined disks, which virtually are flywheels, mounted on a straight driveshaft at each end of the engine.

$ $ $

Plain copper alloy cast irons are used directly for automotive cylinder manufacture, and a 2 per cent copper cast iron has been recommended frequently for use under mild corrosion conditions.

$ $ $

An adaptation of the oxyacetylene flame gouging process is the washing of excess metal from steel castings after risers have been cut off. No machine equipment is required; the process is rapid and efficient, leaving a surface comparable to that of the average large casting. No special handling or positioning is needed as is the case when grinding is employed. Metal may be removed at the rate of 3 to 4 pounds per minute with average equipment. Oxygen consumption per pound of metal removed averages approximately 5 cubic feet with present practice. The operation normally is seven to eight times as rapid as standard grinding practice.

$ $ $

Excessive wear on bearings of motors with geared shafts has been found by one user to result when the driving gear is located immediately above or below the driven gear. Moving the former to one side proved successful in reducing this wear.

Barrel Storage Racks Offer Tonnage Outlet for Structural Steel

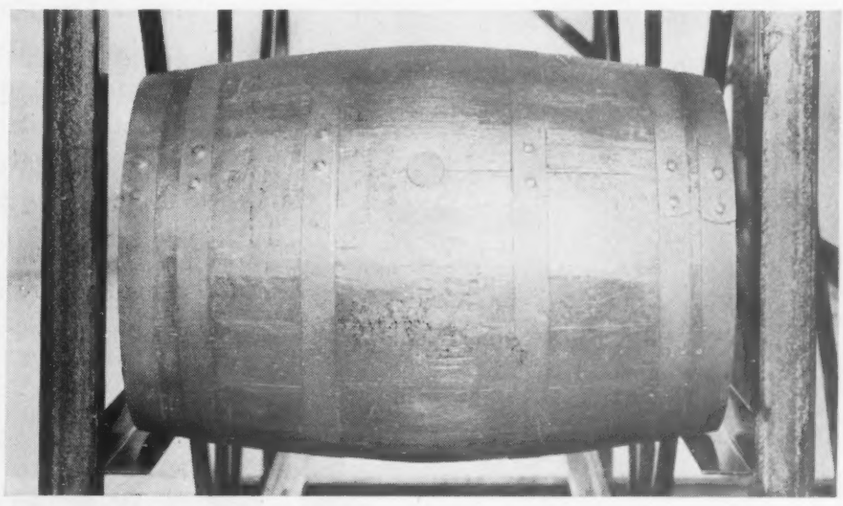
WITH repeal of prohibition has come a need for more modern storage facilities in whiskey warehouses. "Aged in Wood" has long been one of the standard measuring sticks by which the quality of the liquor is determined and it appears doubtful if a wholly acceptable substitute for aging in wood will be discovered soon.

From one-story wooden sheds of early days, whiskey warehouses have been developed gradually until today the more elaborate structures consist of large multi-story buildings with fireproof walls, equipped with electric elevators, heating and ventilating systems, but with wooden racks supporting the barrels.

Although there is little hope to improve upon containers, there are recent developments in barrel racks which offer a substantial tonnage outlet for structural steel. Engineers of the International Derrick & Equipment Co., division of International-Stacey Corp., Columbus, O., have designed an electrically-welded steel barrel rack fabricated in standard units. Typical units are illustrated.

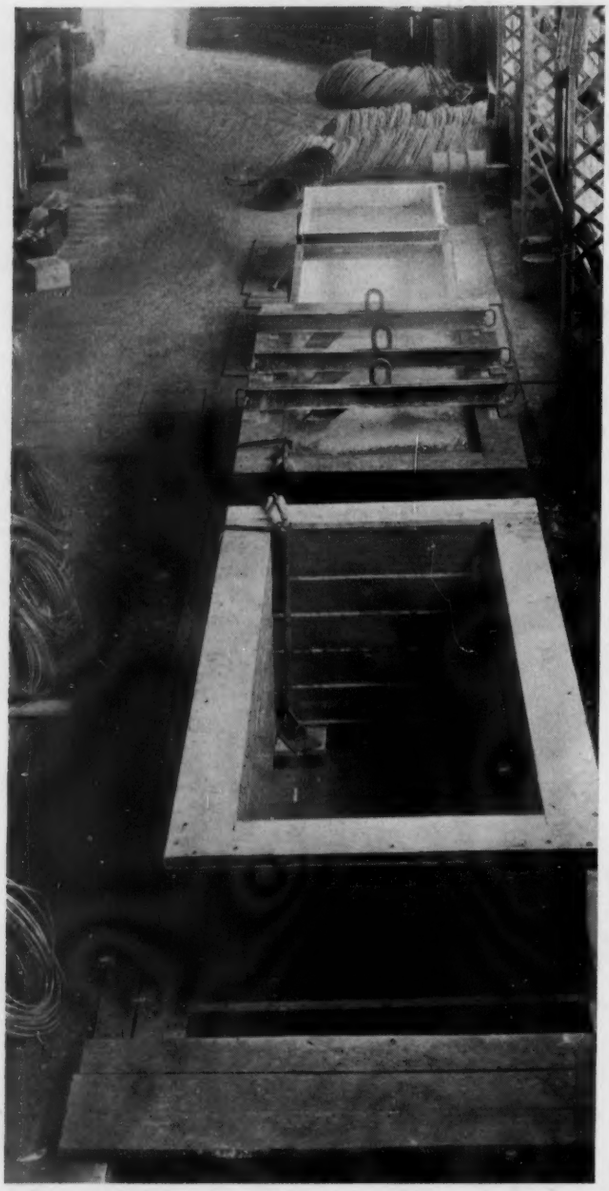
A standard 15-barrel unit is three barrels high and five barrels long, thus when the racks are used in multiples, 10, 15, 20, 25 or 30 barrels may be racked in a row and be accessible from a runway. The units may be placed upon the floors of existing warehouses in which case racks upon upper and lower floors are identical. When erected in multiples, vertically as well as horizontally, to form a complete self-supporting rack structure, the vertical steel members of the racks are varied in size and load carrying capacity from lower to upper tiers.

The accompanying illustration shows four 15-barrel units assembled as they would be in service. The weight of a steel rack structure varies from 22 to 28 pounds per barrel, depending upon whether the racks are used on floors of present buildings or as self-supporting multi-storied structures of various heights. The average 15-barrel rack weighs about 350 pounds, thus a 90,000 barrel warehouse would require in the



Runways for barrels are made of 3 x 3-inch angles. The vertical leg serves to maintain the alignment of the barrels

• NEW HIGHS IN NEW LOWS in pickling costs



Brick sheathed, Triflex-lined Vulcalock tanks in the pickling department of a large wire manufacturer.

WHEN steel men and Goodrich engineers work together on pickling-tank problems, invariably two things happen. Pickling efficiency "takes the high road, and costs take the low road." Production delays, high maintenance charges, frequent tank replacements—all become worries of the past. And the cost per ton of pickled steel drops.

Goodrich Rubber Lining means more than "a lining made of rubber." For example, it means the use of Triflex—a Goodrich construction composed of a layer of hard rubber sandwiched between two layers of soft, resilient rubber. With Triflex, the acid resistant qualities of hard rubber are preserved without sacrificing the cushioning properties of soft rubber. Overlapping Triflex expansion joints at regular intervals prevent cracking or buckling of the lining.

When Triflex is applied by the Vulcalock Process—the exclusive Goodrich method of bonding rubber to metal—an adhesion of 700 to 1000 pounds per square inch between the lining and the steel tank wall is the result. For added protection against gouging, brick sheathing equipped with rubber expansion joints is made a part of the construction.

Corrosion resistant, leak proof, unaffected by

Goodrich

PICKLING EFFICIENCY

Pickling wire in one of a series of brick sheathed, Triflex-lined Vulcalock tanks.

shock or abrasion . . this is the Goodrich combination unit of rubber, steel and brick which continues to attain new highs in pickling performance. And at the same time it insures rock bottom costs per ton of pickled steel.

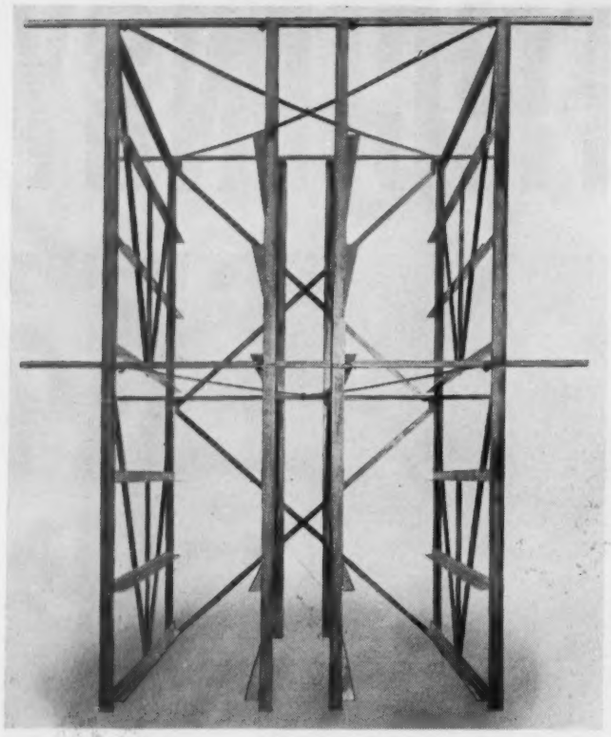
Whatever your particular problems may be, Goodrich engineers stand ready to help you analyze them and to make specific recommendations . . . The B. F. Goodrich Rubber Co., Mechanical Rubber Goods Division, Akron, Ohio. In Canada: Canadian Goodrich Company, Ltd., Kitchener, Ontario.

Installing brick sheathing inside a Triflex-lined steel pickling tank. Note Triflex expansion joints in the rubber lining. Rubber expansion joints in the brick are also used. This tank is used for pickling steel sheets, by a manufacturer of automobile frames.

GOODRICH MECHANICAL RUBBER GOODS INCLUDE:
Rubber Lining for Pickling, Plating and Storage Tanks, Tank Cars, Pipe and Valves . . . Conveyor, Elevator and Transmission Belting . . . Water, Air, Steam, Suction and Fire Hose . . . Hard Rubber Goods . . . Packing . . . Molded Rubber Products . . . and a Complete Line of Miscellaneous Rubber Items.

ALL *products problems* IN RUBBER

Rubber Lining



End view of a 4-section rack designed for a combined storage capacity of 60 barrels

neighboorhood of 1000 tons of steel.

Barrels rest in 3 x 3-inch angle rails spaced 36 inches back to back, the upturned legs of which prevent the barrels from being turned to such a position that they could fall between the rails. The rails are electrically welded to the vertical column members and to the diagonal bracing members. The diagonal members assist in transferring the barrel weight to the columns and also play an important part in the bracing system. Vertical and horizontal bracing systems in two other planes also are provided, making an exceedingly rigid structure.

Vertical or column members have plates welded on each end which serve as a connecting means for the columns themselves as well as for bracing systems, runway supports, catwalk supports, and the like. The assembly and welding processes are accomplished with the aid of full-size jigs which locate and clamp all the angle members forming the side of a unit. By employing this type of welded construction, the number of field bolts has been reduced to a ratio of less than one bolt per barrel.

Supplies Data To Show Grain Size Effect in Steels

In an article discussing the classification of tool steels according to P-F characteristic, published in STEEL for May 14, pp. 43, 44, a number of tables were presented to show the effects of grain size and other factors upon various physical characteristics of certain heats of steel. The article was abstracted from a paper by B. F. Shepherd, manager rock drill division, Ingersoll-Rand Co., Phillipsburg, N. J., who points out that data for Tables IV and V were supplied by courtesy of R. L. Wilson, Timken Steel & Tube Co., Canton, O.

Table IV showed the influence of carbon content, grain size and molybdenum content upon Izod impact values; Table V listed figures to show the influence of carbon content and grain size upon surface hardness and depth of hardness penetration in 1-inch and 3-inch round bars. Acknowlegement should have been made to Mr. Wilson for these data.

Claims Cooling Rate Fixes Composition of Pearlite

HABITS and laws of decomposition of supercooled solutions, particularly with regard to austenite, comprised the topic of an investigation reported on by G. B. Upton, professor of experimental engineering, Cornell university, Ithaca, N. Y., at a Pennsylvania interchapter of the American Society for Metals in State College, Pa., May 4-5.

His subject was intimately related to the heat treatment of steels. An interesting deduction made as a result of the study of supercooled austenites of all carbon contents was that the composition of pearlite (iron carbon eutectoid) is not fixed, but covers a wide range of carbon contents, widening both toward iron and carbon as the cooling rate increases.

Austenite, it will be recalled, upon normal cooling, breaks down into pearlite and ferrite (Fe) in the low-carbon range, and into pearlite and cementite (Fe_3C) in the high carbon range. Pearlite has a normal composition of about 0.87 per cent carbon.

Hardened steels, Prof. Upton pointed out in conclusion, contain more or less of many structures—austenite, pearlite or sorbite, martensite, troostite, to name the four groupings which have fairly definite sets of properties. To find out how much a steel contains of each of these requires measurement simultaneously of at least four sets of properties, since four unknowns require four equations to fix them.

Until systematic experiments are performed wherein many samples of one steel are put through many heat treatments and stages of treatment, and at each stage at least four critical properties of the metal are measured simultaneously, it is impossible to solve the problem of the amounts of the various structures in the steel and the contributions of each to the final results.

Introduces High Tensile Steels for Carbuilding

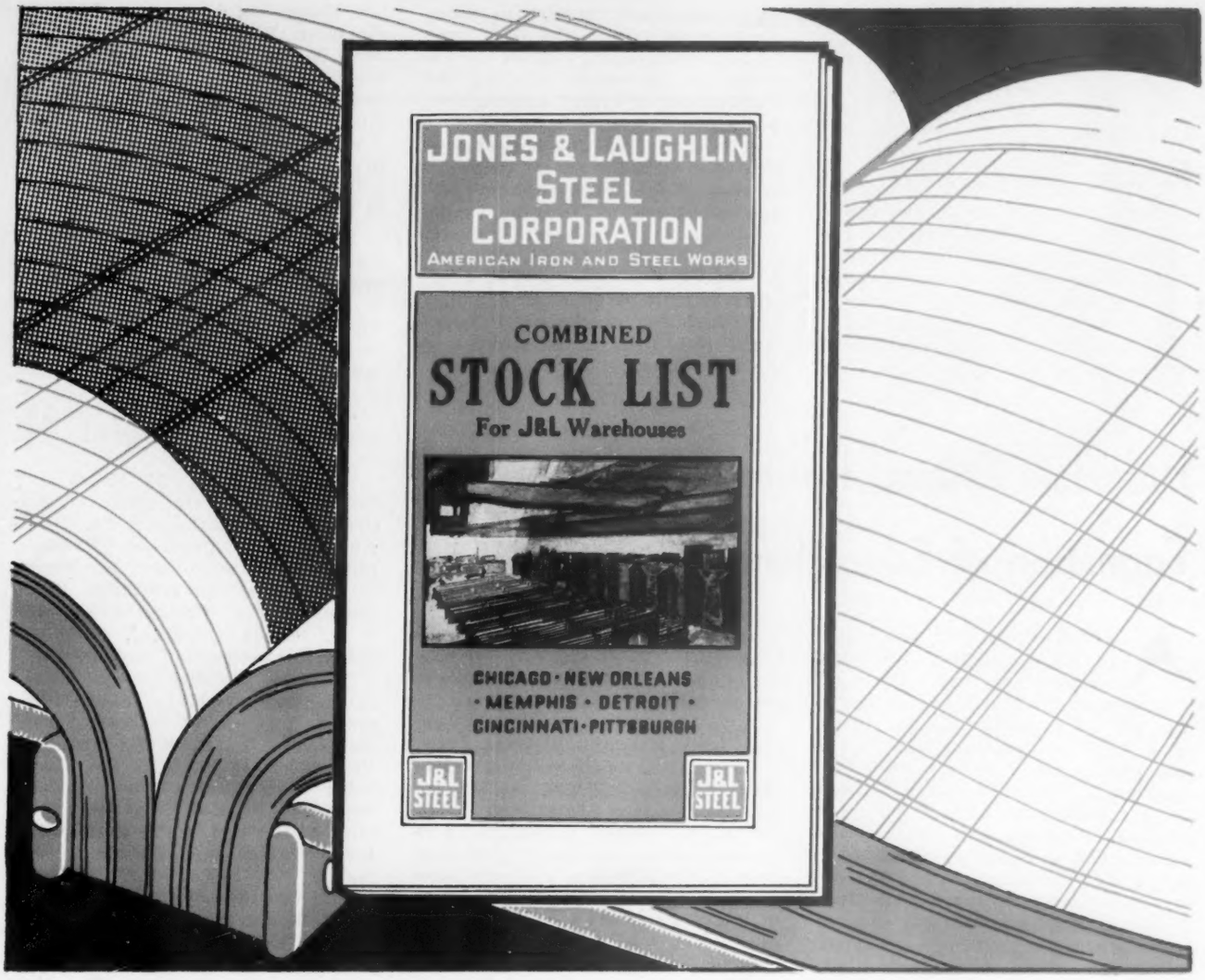
Two new high tensile steels, adapted to construction where light weight is desired, have been placed on the market by the Illinois Steel Co., subsidiary of United States Steel Corp.

U. S. S. Cor-Ten is the name given to a new low chromium copper silicon steel having a corrosion resistance approximately 4 to 6 times that of ordinary open-hearth steel. This steel has a yield point of 50,000 to 60,000 pounds per square inch, tensile strength of 65,000 to 75,000 pounds per square inch, elongation of 28 to 23 per cent in 2 inches, and good welding properties.

The second new steel, USS Man-Ten, is a medium manganese steel with higher tensile strength but lower resistance to corrosion than USS Cor-Ten. The yield point of USS Man-Ten is 55,000 to 65,000 pounds per square inch, tensile strength is 85,000 to 95,000 pounds per square inch, elongation is 25 to 20 per cent in 2 inches and weldability is good.

These steels are particularly adapted to the construction of railroad passenger and freight cars, elevated railway cars and street cars. They permit substantial reductions in weight without sacrificing strength. USS Cor-Ten is being used for the body of a new model street car being built for the American Transit association.

In addition to Illinois Steel Co., American Sheet & Tin Plate Co., American Steel & Wire Co., Carnegie Steel Co. and Tennessee Coal, Iron & Railroad Co. will manufac-



HERE'S YOUR STEEL STOCK LEDGER

J&L STEEL

For Every Need . . . the Right Quality of Steel in a Full Range of Sizes

Prompt delivery, without substitution or sacrifice of quality, is of greater importance than ever in the buying of steel. **J&L** Warehouse stocks are complete, and every item is of known quality. They are held at convenient points ready for immediate shipment in any quantity. Fit **J&L** Steel Warehouse Service into your plans for 1934 business acceleration. You will profit by using our Stock List. Write for a copy today.

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS
JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

AND BE SURE . .

J&L WAREHOUSES

CHICAGO	CINCINNATI	DETROIT	NEW ORLEANS	PITTSBURGH
Virginia 1600	Main 2324	Plaza 0470	Franklin 1131	Hemlock 1000

PHONE

LOUISVILLE—Magnolia 1693 . . . Stock of Bars for Concrete Reinforcement and Bar Fabricating Yard

MEMPHIS—6-4836 . . . Distributing Warehouse for Pipe, Sheets, Spikes and Wire Products. Reinforcing Bar Warehouse and Fabricating Shop

ture the two steels, which are available in flat rolled products and light shapes.

Cast-Steel 4-Point Hook Removes Ladle Skulls

Various steelmakers in the Pittsburgh district are employing a recently devised hook for skulling their blast furnace and steelworks ladles which is built with four grappling hooks. Each grappling hook is provided with a certain amount of movement, upward and downward, to enable the crane operator to maintain a secure grip on the skull, once the hook is engaged, without the necessity of accurately spotting the crane trolley or bridge directly over the ladle.

Ordinary ladle skulls are removed with no other labor except the crane operator and in some instances one man to direct the removal of the skull from a convenient distance. Cooling the ladle before removing the skull is unnecessary. The hook, which is built by William M. Bailey Co., Pittsburgh, is claimed to remove skulls with little or no damage to the ladle lining.

Porcelain Enamel Institute Proposes Formation of Educational Bureau

ALTHOUGH matters pertaining to NRA and code activities occupied the major share of attention at the fourth annual meeting of the Porcelain Enamel institute, held in Cleveland, May 16-17, one session was devoted to technical problems. Included among these were architectural uses of porcelain enamel, technical and market research, and co-operative advertising. About 100 representatives of the industry attended the two-day meeting.

Speaking on architectural uses of porcelain enamel, Bennett Chapple, vice president, American Rolling Mill Co., Middletown, O., said he expected to see a doubling of the use of this material in the next few years. Public acceptance is the chief stumbling block at present, but this is being overcome with pioneering work being done on residences in various price classes ranging up to $55,000.

Attachment Is Problem

Mr. Chapple stated that the industry will profit through the growing trend for architectural expression through porcelain enamel. The industry must not be content to see the material used only for garages and filling stations. The problem, he said, is not enameling technique, but the method of attaching the material to structures. Considerable work is being done along this line and out of it will come satisfactory and economical systems.

Discussing what the public does not know about porcelain enamel, William Hogenson, president, Chicago Vitreous Enamel Product Co., Cicero, Ill., pointed to the necessity of an education and advertising campaign to serve three purposes: 1. To acquaint manufacturers with fields of distribution for products finished in porcelain enamel; 2. to acquaint users with the advantages of porcelain enamel; and 3. to acquaint purchasers of the difference between enamel and porcelain enamel.

E. L. Lasier, vice president, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., spoke at length on the development of technical and market research through an educational bureau and R. A. Weaver, president, Ferro Enamel Corp., Cleveland, discussed co-operative advertising as the basis for industry growth. The institute unanimously passed a resolution asking the board of trustees of the institute to form an educational bureau and to make accessible such funds as are available for operation of such a bureau.

Manufacturers Exhibit

In conjunction with the meeting, the institute had invited manufacturers to display their methods of attaching porcelain enameled units to the exteriors and interiors of houses and commercial buildings. The following were represented with exhibits: Davidson Enameled Products Inc., Lima, O.; Insulated Steel Construction Co., Middletown, O.; Ferro Enamel Corp., Cleveland; Vitreous Enameling Co., Cleveland; United States Stamping Co., Moundsville, W. Va.; Wheeling Corrugating Co., Wheeling, W. Va.; Architectural Metals Corp., Cleveland; Veos Cleveland Tile Inc., Cleveland; Stran Steel Co., Detroit; and E. B. Stewart, Chicago.

R. W. Staud, assistant to president, Benjamin Electric Co., Des Plaines, Ill., was elected to serve a third term as president of the institute. All other officers were re-elected as follow: Vice presidents, Earle S. Smith, president, Toledo Porcelain Enamel Products Co., Toledo, and F. E. Hodek Jr., secretary, General Porcelain Enameling & Mfg. Co., Chicago; treasurer, William Hogenson, president, Chicago Vitreous Enamel Product Co., Cicero, Ill.; and secretary, George P. MacKnight, 612 North Michigan avenue, Chicago.

A board of trustees, composed of five representatives from each of the institutes five divisions, was selected as follows:

Jobbing shop division—Earle S. Smith; R. F. White, executive vice president, Mullins Mfg. Corp., Salem, O.; W. A. Donald, secretary-manager, Vitreous Enameling & Stamping Co., New York; William Mahoney, assistant general manager, Chattanooga Stamping & Enameling Co., Chattanooga, Tenn.; and Louis Ingram, president, Ingram-Richardson Mfg. Co., Beaver Falls, Pa.

Sign division—F. E. Hodek Jr.; George S. Blome, vice president, Baltimore Enamel & Novelty Co., Baltimore; F. S. Davidson, Davidson Enamel Products Inc., Lima, O.; H. L. Beach, vice president, Beach Enameling Co., Coshocton, O.; and J. T. Penton, president, California Metal Enameling Co., Los Angeles.

Table top division—R. W. Staud; M. N. Hurd, president, Ingram-Richardson Mfg. Co. of Indiana, Frankfort, Ind.; E. H. Weil, president, Vitreous Steel Products Co., Cleveland; R. G. Calton, vice president, Tennessee Enamel Mfg. Co., Nashville, Tenn.; and W. H. Brett, secretary, Enamel Products Co., Cleveland.

Frit division—William Hogenson; R. A. Weaver; E. L. Lasier; W. R. Greer, vice president, Porcelain Enamel & Mfg. Co., Baltimore; and G. K. Fry, vice president, Enamelers Guild Inc., Pittsburgh.

Co-operating membership division—Bennett Chapple; R. D. Landrum, district sales manager, Harshaw Chemical Co., Chicago; F. A. Moeschl, vice president, Newport Rolling Mill Co., Newport, Ky.; L. D. Mercer, assistant manager sheet sales, Republic Steel Corp., Youngstown, O.; and R. L. McGean, vice president, McGean Chemical Co., Cleveland.

The executive committee will include in addition to the officers Louis Ingram, G. S. Blome, E. H. Weil, R. G. Calton and R. A. Weaver.

Code Authority Named

At an industry meeting held on the first day of the convention, a supplementary code authority was elected to administer the code of fair competition which became effective April 10. The code authority will be composed of the officers of the institute, except the secretary; the executive committee; E. L. Lasier and H. H. Wineburgh, president, Texlite Inc., Dallas, Tex., the latter being representatives from the industry at large.

The instiute's constitution and by-laws were revised to conform with NRA and the code of fair competition.

ADVERTISING PAGES REMOVED

PROGRESS IN STEELMAKING

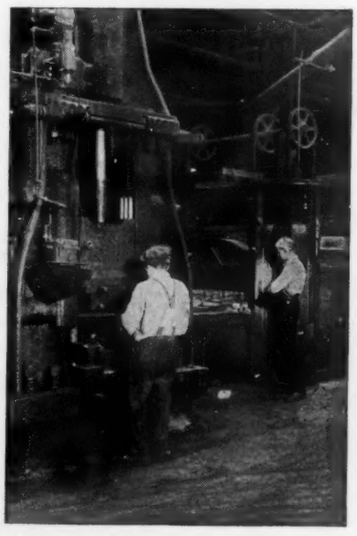
REPAIRING the floors in various departments of steel mills now can be effected by the application of a cold mastic compound which can be bonded to asphalt, concrete, composition or brick floors. The product is mixed with large quantities of cement, sand and gravel. By varying the quantity of the aggregate, a wearing surface sufficiently hard to withstand heavy loads on steel wheels or a surface soft as rubber for foot traffic can be obtained.

♦ ♦ ♦

Based on numerous experiments conducted at a European plant, paint of the following composition is recommended for steam pipes, boilers, etc. at iron and steel plants: Zinc oxide, 30 per cent; barium sulphate, 30 per cent; anhydrous sodium silicate (water glass) 20 per cent; and water, 20 per cent. Mineral constituents are used exclusively for coloring.

♦ ♦ ♦

An installation for annealing wide strip steel continuously has been laid out but the unit is confined to thin gages. The design calls for a counterflow type of heat recovery and atmosphere. Such a furnace heated to 1300 degrees Fahr. will consume approximately 65 kilowatt hours per ton of work annealed. With a travel speed of 60 feet a minute, the unit will handle 50 tons of 30-inch wide strip a day.



♦ ♦ ♦

Lining the cover of a hot metal ladle with a refractory containing a newly developed binder has prolonged its life appreciably. The refractory material and binder mixed with water develops a prefired cold strength within 24 hours.

COPPER stools, which form the bottom of ingot molds during the pouring operation, are a recent development. This type stool has the advantage of conducting heat away from the ingot quickly and has been found practical from the standpoints of operation and cost.

♦ ♦ ♦

Passing molten iron and steel through a column of granular, carbonaceous material which is heated through an electric current, is a recently patented method to treat these metals so that they are refined and deoxidized. The column is enclosed in an air-tight refractory chamber, except for the top layer, and it is claimed that only a slight oxidation occurs in that locality. The carbonaceous material may be graphite or coke, and with the latter the sulphur pickup is extremely low.

♦ ♦ ♦

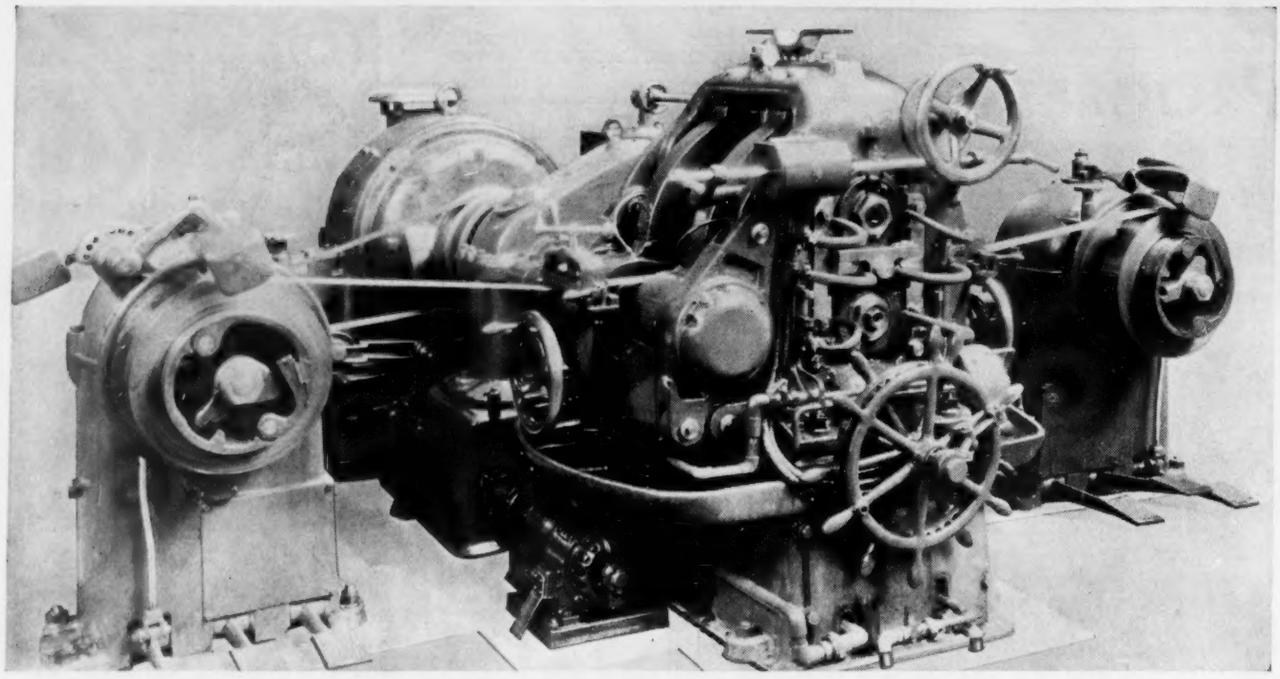
Corrosion and disintegration of steel are claimed to be prevented by recently developed coatings which withstand exposure to pickling acids. The paint coatings may be applied over rusted surfaces without preliminary preparation. Effectiveness of the coatings is attributed to the impermeability of the film because of the absence of microscopic pores, and the dense continuous coating formed through the blending of the oxidized, inert and chemical stable natural element with special vehicles.

♦ ♦ ♦

The oxygen lance is an effective tool for opening up the tap holes of blast furnaces when it is properly set-up and employed. Difficulty was experienced at one furnace because of inadequate equipment. Using ¼-inch pipe as a lance, ¼-inch oxygen hose and only one regulator, it was found impossible to obtain sufficient oxygen. Pressure was boosted to 350 to 400 pounds, but this resulted in considerable regulator trouble. By adopting a two-regulator set-up and substituting ⅜-inch hose for the smaller size, satisfactory results were obtained. Furthermore, oxygen pressure of 100 pounds proved ample.

♦ ♦ ♦

Refinements in the design of a recently marketed motor-driven hammer are intended to increase the speed and to reduce the cost of maintenance. The motor is mounted on rubber insulators. The board clamp and foot treadle are full floating. Rolls may be adjusted ⅜ to ½-inch without roll gear interference. Pin connections not mounted in rubber are bronze bushed and lubricated by pressure grease gun. All parts attached to the friction bar may be removed or replaced without removing the bar from its top connection.



Ring-type, cold strip mill, developed in Sweden and now marketed in United States by Treadwell Engineering Co., is particularly adapted to rolling stainless and high carbon steels to thin gages

Ring-Type Cold Strip Mill Is Introduced in United States

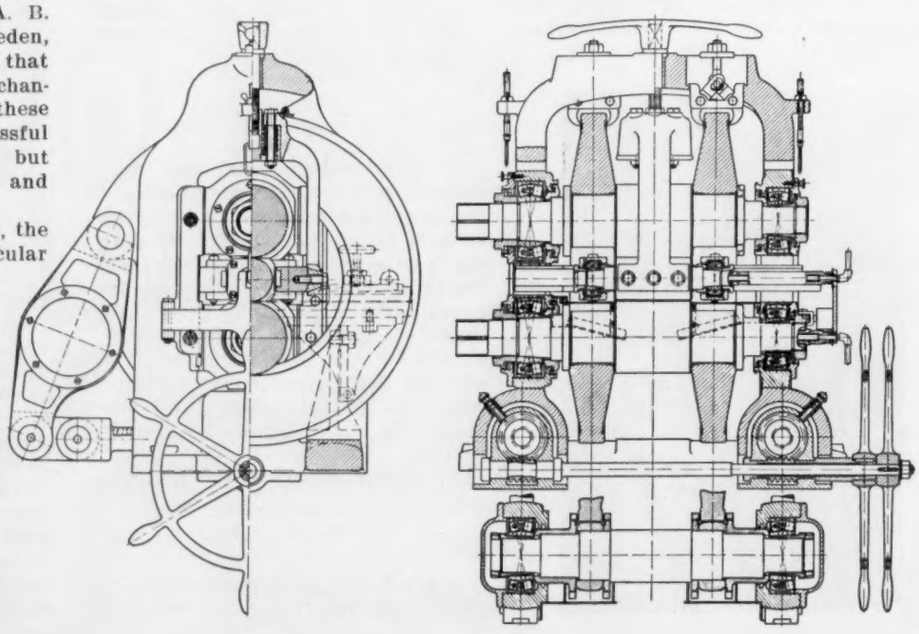
A NEW cold strip mill has been placed on the market by the Treadwell Engineering Co., Easton, Pa. It is said to be the first successful ring-type mill for this use. One of these mills has been set up at the company's plant and now is in operation for demonstration purposes.

Developed in 1926 by the A. B. Svenska Kullagerfabriken, Sweden, the mill is manufactured in that country by the Lidkepings Mechanical Works. Altogether 25 of these mills have been placed in successful operation, mostly in Sweden, but also in Germany, Japan, France and Poland.

While applicable to all metals, the new mill is said to be of particular value in rolling stainless and high carbon steels down to thin gages, including so-called ribbon strip. It is adequately equipped with safety devices for preventing hard-to-handle stainless from getting loose from the mill and causing injuries to workmen or damage to the equipment.

With regard to design, the mill is essentially 3-high with a baby middle roll. Rolling takes place between the bottom and middle rolls. The characteristic features of design pertain to the method of taking up the rolling pressure and that of adjusting the rolls.

Instead of transmitting the rolling pressure in conventional fashion from the rotating rolls through bearings, chocks and adjusting screw to the mill housing, which ultimately provides for the necessary reaction to the separating force between the rolls, the rolling pressure is directly transmitted to and absorbed as internal stress in two large rings con-



Cross sectional elevations of new mill, showing arrangement of rolls and the encircling rings, which rotate with the rolls. The whole may be likened to a roller bearing in which the baby roll is the shaft, the supporting rolls are the rollers and the rings are the races

HIGH AND LOW CARBON STRIP STEEL

HOT AND COLD ROLLED -- *in all tempers*

The rapid growth and development of modern forming and stamping practice has widened the scope and created new demands for strip steel in many branches of industry.

Since 1897 we have specialized in high quality Hot and Cold Rolled Strip Steel, which constantly met the increasing requirements in this field.

A wide range of high and low carbon strip steel in all tempers—widths from ¾" to 24"—hot and cold rolled —coiled or cut to lengths that best suit your needs.

Also Bright Cold Rolled ALLEGHENY STAINLESS STEELS in all grades. Excellent for drawing and forming. Resists corrosion, may be welded and soldered.

Save with Steel

WEST LEECHBURG STEEL COMPANY

General Offices: UNION BANK BLDG., PITTSBURGH, PA.

Branch Sales Offices:

NEW YORK	CHICAGO	DETROIT	CLEVELAND
DAYTON, OHIO	ST. LOUIS	TOLEDO (Dean Higgins & Co.)	
NEWARK	PHILADELPHIA	TORONTO, ONT. (Jessop Steel Co.)	

BUFFALO—ROCHESTER—SYRACUSE
(*Brace-Mueller-Huntley, Inc.*)

WAREHOUSE STOCKS of COLD ROLLED STRIP STEEL are carried by:

EDGCOMB STEEL CO.—PHILADELPHIA
EDGCOMB STEEL CORP.—NEWARK
JOS. T. RYERSON & SON—CHICAGO

tacting the necks of the large rolls. These rings, of hardened alloy steel, are suspended on the necks of the top and bottom rolls so that they are free to rotate with the rolls. The system of rings and rolls may be likened to a roller bearing where the middle roll corresponds to the shaft, the top and bottom rolls to the rollers and the rings to the outer race.

How Alignment Is Maintained

The rolls are kept in their correct position by light roller bearings, mounted on the extension of the roll necks, with the chocks located in the windows of a light cast-iron frame. The bearings of the bottom roll are fixed in the frame, those of the middle roll are mounted in a yoke-shaped member, suspended from an adjustable spring device at the top of the frame, while the top roll bearings are only held in horizontal direction.

By tightening the springs, the middle roll, the top roll and the rings are lifted upwards, until the inner periphery of the rings contacts the bottom roll necks. After contact has been established, a final adjustment of the spring tension causes a certain amount of pressure to prevail in all contact surfaces. This initial stress has the effect of making the whole assembly act like a friction clutch. The bottom roll, being connected to the drive, sets the rings as well as the top and middle rolls in rotation by virtue of the frictional force produced by the initial spring pressure.

Regardless of the magnitude of the rolling pressure, this initial spring pressure will always allow the driving moment of the rolls and rings to be greater than the braking moment, occurring when a strip is inserted in the mill. It is therefore impossible for an uncoupled roll to stall. If the strip refuses to be gripped, it will slide against the rolls, but these will continue to rotate. The design thus provides for positive drive of all rolls with only one roll coupled, rendering the pinion stand superfluous.

Adjustment Is Simple

Adjustment of the rolls is affected in the following manner. A horizontal shaft, mounted in roller bearings and adjustable horizontally, contacts the outside periphery of the large rings. The horizontal adjustment of this shaft is effected by turning the handwheels on the free side of the mill which causes the rings to be displaced in relation to the rolls, with the result that the points of contact between the necks of the top and bottom rolls and the rings will shift along the inside periphery of the rings and the distance between the rolls will be altered. Each ring can be displaced independently of the other, which allows the mill operator to adjust the rolls to compensate for eventual irregularities in strip gauge.

The rolls are externally cooled. A centrifugal pump, driven by a separate motor, forces the cooling liquid from a collecting vessel underneath the bedplate, through pipelines to rolls and rings. The liquid is then collected in the basin-shaped top of the base plate and allowed to flow down to the collecting vessel which is water-cooled.

When the rolls are to be changed, the rings are suspended in claws at the top of the frame, and the top roll bearing chocks temporarily attached to a tackle provided on the frame. The middle and bottom rolls are then easily taken out lengthwise through the window and then the top roll.

The following advantages are obtained with this design:

(1) Sliding friction being eliminated, the mill can operate at high speed under full load with highest mechanical efficiency.

(2) As no space is required for bearings on the stressed part of the roll necks, the neck diameter can be made within a few per cent of the roll diameter, which insures maximum rigidity of rolls and minimum stress in roll necks.

(3) The rings being made of high quality steel and with a heavy cross section, in combination with the fact that the rolls are exceptionally rigid and as the frictional heat in bearings is practically eliminated, the gage variation of the strip is minimum.

(4) Simple driving arrangement, as no pinion stand is required, yet positive drive on all rolls.

(5) High load capacity per pound of weight of mill and high production capacity with minimum power consumption.

(6) Ease of operation due to convenient arrangement of adjusting and control members.

The demonstration mill rolls strip in any gage, down to approaching zero-gage, in widths up to and including 5½-inches. Of interest is the fact that this ring-type mill, as compared with the conventional 4-high mill and the cluster-type mill, is that the complete stand is very small in relation to its capacity. The mill is completely equipped with S. K. F. bearings.

Since the ring-type cold mill is equipped with strip guides of special design, it can be used for reversible rolling. The complete mill will then comprise mill stand proper, one coiler on each side, speed reducer and reversible motor. This arrangement allows for a high output as well as flexibility of operation. The demonstration mill in Treadwell Engineering Company's plant is of this type. It is aso possible to arrange a continuous cold rolling mill comprised of several ring type mills in tandem. Abroad such a mill, consisting of four stands, is successfully producing high carbon strip steel.

Properties of Cromansil Structural Steels

(*Continued from Page* 35)

riveted joints in Cromansil steel plates was carried out at Lehigh university, the plates being furnished by the Lukens Steel Co. and the rivets by the Electro Metallurgical Co. Two lap and two butt joints were fabricated by the Downingtown Iron Works, one of each being made with the air hammer, the other with hydraulic pressure. The plates were ⅝ inch thick and 12 inches wide. The rivets were of Cromansil composition. Three rows of rivets were used in each case making nine rivets in a single shear in the lap joint, and 18 rivets in double shear in the butt joint. Both butt joints failed in the main plate at a section through the outer row of rivets at stresses of 106,000 and 106,500 pounds per square inch on the net section of the plate.

Failure Occurs at Joints

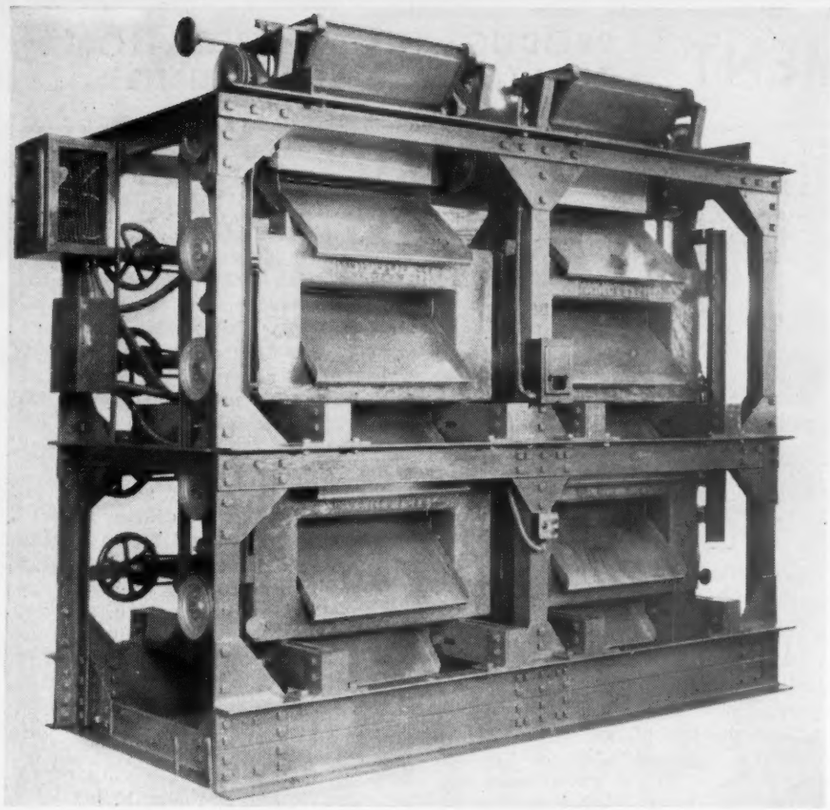
Both of the lap joints failed in the rivets at stresses in single shear of the rivets of 67,000 pounds per square inch for the air hammer joint. and 78,200 pounds per square inch for the hydraulic joint. The stress in the plate at failure was 83,000 and 97,000 pounds per square inch respectively for the air hammer and hydraulic joints.

Thus Cromansil plate and Cromansil rivets enable one to realize riveted joints of the highest strength, quality, and efficiency.

The exceptional high shearing strength of Cromansil steel explains its remarkable performance in deep oil well casings, for which several thousand tons have been used, and indicates its use for other threaded members subjected to heavy stresses.

The use of high tensile steels in structures such as bridges, pressure vesels, etc., is not new. We believe that Cromansil steel affords the best low cost high strength structural steel on the market, whether it be used for welding or riveting, and should be indicated wherever saving in weight can be realized by the increased strength (almost double) over ordinary carbon steel a saving obtainable at a nominal increase in cost.

ADVERTISING PAGES REMOVED



—Photo courtesy Magnetic Mfg. Co., Milwaukee

A large magnetic separator, used in the concentration of ores and minerals

LARGE USES OF STEEL IN SMALL WAYS

261st Article ◆ Magnetic Separators

MAGNETIC engineering—the industrial application of electromagnetism for concentration and purification of materials, protection of process machinery against tramp iron, and for handling and conveying services—has attained a marked degree of development during the past ten years.

Magnetic machines have been perfected for the separation and purification of material heretofore unresponsive to magnetic action, including minerals, grains, foodstuffs, and many raw materials, as well as ores not previously considered susceptible to magnetic separation. Magnetized roller conveyors have been developed which possess the unique property of moving iron and steel pipes and sheets up an inclined plane against gravity. Magnetic clutches, although not new to industry, have been brought to a degree of efficiency and range of application unthought of years ago.

The field of application of magnetic separation equipment has been extended from industries such as flour milling, mining, metal refining and casting—fields which have long used magnetic equipment for protection of machinery and reclamation of materials—to process manufacturers such as ceramics, paper, rubber, and food industries, where magnetic equipment is required to assure purity of product as well as for protection to valuable process equipment.

Separators are made in many types and in various sizes, weights ranging from less than 100 pounds to around 30,000 pounds. Steel is the material employed principally in the manufacture of this equipment, the industry accounting for the consumption of about 100 tons annually during a normal year. Principal products required are structural shapes, including angles, channels and I-beams; sheets and strips; bars, including hot and cold-rolled material; and nonmagnetic alloys in sheet and bar form. Structural steel frames for magnetic separators at one time were considered impractical, due to their forming a part of the magnetic flux. Later development, however, has made it possible to direct the flux lines so that they are received into the frame only in a negligible amount.

Simple types of separators, such as used for the removal of tramp iron from grain, consist of a magnet, a feed gate for the regulation of the flow of grain and a safety trap which permits the discharge of particles collected by the magnet. Framework and various parts are built largely of rolled steel. Larger units may employ a magnetic pulley which separates materials transported on an endless belt and which serves to protect crushing, grinding and pulverizing equipment.

Cleaning Coal and Ore

This type is adapted for removing foreign pieces from coal or ore, for example. As the load is discharged from the pulley, which acts as the head pulley on the conveyor belt, magnetic and nonmagnetic material drop into separate piles. Common sizes of pulleys range from 12 to 36 inches in diameter and from 18 to 36 inches long and have a magnetic pull through a conveyor belt ¼-inch thick of from 8 to 67 pounds per square inch, depending on the size of the pulley.

Illustrated is one of the largest separators built, weighing nearly 15 tons and being about 8 feet wide, 7 feet long and 10 feet high. It is used in the concentration of ores and minerals, being adapted to the separation of feebly magnetic particles. This segregation is effected by stages of increased magnetic intensity operating on the varying susceptibility of different ores and minerals to magnetic attraction. Each of the magnetic fields has a division gate which provides for the delivery of the separated products into channels, where they are directed to the down spouts. Nonmagnetic material is delivered to the final discharge opening at the base of the separator. Manufacture of this type of equipment requires a wide variety of steel products as well as castings, including shapes, bars and flat rolled material.

Another form of separator is designed primarily to separate free iron from finely ground material. This is accomplished by agitating the material as it is moved on a conveyor through a magnetic field. Nonmagnetic particles flow onto side downspouts while magnetic material is retained on the conveyor and automatically discharged as it leaves the magnetic field.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Spray Booths—DeVilbiss Co., Toledo, O., recently announced a series of direct exhaust type spray booths designed especially for the peculiar requirements encountered in the application of flock. These new units permit the concentration of spraying operations in one location, prevent material from scattering throughout the finishing room, and reclaim all sprayed flock not applied to articles coated. Booths range in sizes from 2 to 10 feet frontal width. All are equipped with standard DeVilbiss direct type exhaust fans. Removable cheese cloth screens at rear of booths collect the flock and prevent it from passing out of the exhaust pipe.

♦ ♦ ♦

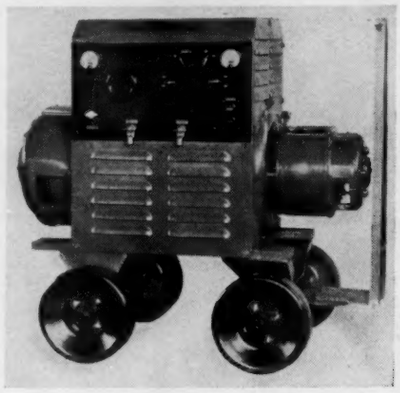
Bench-Type Hack Saw — R. B. Rodgers Mfg. Co., 2381 East Twenty-seventh street, Los Angeles, is building a new motor-driven hack saw designed for bench use in tool rooms, machine shops, etc. Features include vertical guide posts and steel frame slide; uniform feed pressure through entire cut; an automatic switch to stop the machine at any desired depth of cut; quick opening vise which swings for angle cutting to 45 degrees; and a frame latch.

♦ ♦ ♦

Hydraulic Pump—John Robertson Co., 121-137 Water street, Brooklyn, N. Y., is building a small capacity high-pressure hydraulic pump. It is available in sizes from 1 gallon at 6000 pounds hydraulic pressure to 12 gallons at 4500 pounds hydraulic pressure. This unit is driven by a gear reducer motor direct connected to the pump shaft which rotates at 100 revolutions per minute. Spring balanced hydraulic safety relief valves are employed.

♦ ♦ ♦

Arc Welder — Universal Power Corp., 1719 Clarkstone road, Cleveland, now is incorporating an entirely new principle of arc stabilization in its arc welder, eliminating the need for the use of old style power consuming reactors. The company states that due to the smoothness of arc stability obtained, operators lose minimum time in starting and maintaining their arc. Further economy is effected by the machine, shown herewith ,through its efficiency in depositing weld metal, low power consumption, etc.



Universal arc welder incorporates new arc stabilization principle

♦ ♦ ♦

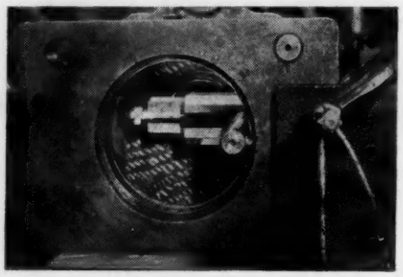
Sheet Grinder—Mattison Machine Works, Rockford, Ill., has developed a new type of abrasive belt grinder for grinding alloy, carbon and other forms of sheets. The model with reciprocating table, shown herewith, is designed for the finer finishing operations where more than one pass is required. Thin sheets resting on the curved surface of the table are flexed so that buckles are evened out and a flat cross section always is presented to the grinding belt. Since the sheet is flexed in the direction opposite to the curve of the grinding roll, penetration of the abrasive grain into the surface of the metal is improved and better cutting action is said to result.

The roll feed model is designed for superficial and rough grinding where one pass under the abrasive is sufficient to clean the surface to the desired extent. This model also lends itself to tandem operation whereby a number of units may be set in line, with the stock passing from one to the next progressively.

Main arm carrying the abrasive grinding belt, driving and idler rolls, is adjustable vertically as a unit on the heavy column for different thicknesses of material and for setting to the cut. Belts are changed quickly as it only is necessary to lower the top tensioning idler, remove the belt, slip on another and run up the tension roll. Standard sizes of these machines carry belts up to 50 inches wide. The reciprocating table model grinds sheets up to 48 inches wide and in length as required. The roll feed model handles sheets up to 48 inches wide and any length.

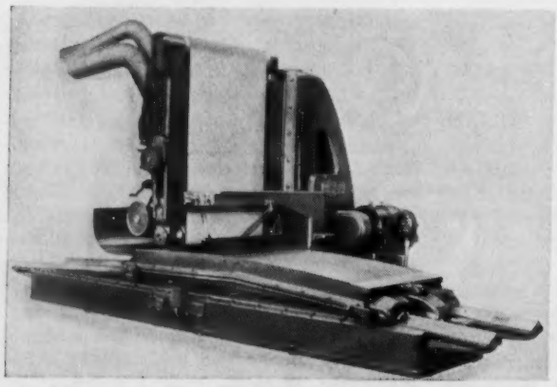
♦ ♦ ♦

Boring Bar—Roy V. Russell, 1207 Calumet avenue, Middletown, O., recently developed a boring bar which will bore sizes from 9/16 to 12 inches diameter, and has micrometer readings for all adjustments. Referring to the accompanying illustration, a 1¼-inch boring bar was used to bore this circular die on a milling machine. On the same setting the tool will bore any diameter hole up to 12 inches by adjusting slide.



Nine-inch hole being bored in blanking die by Russell boring bar

The shank of the tool may be made in Nos. 9, 10, 11 and 12 Brown & Sharpe tapers or Nos. 4, 5, 6 Morse tapers. All shanks are interchangeable. The tool consists of three boring bars which slide and clamp in the T-slot of the main head. Bars are as follows: 1—½-inch diameter boring bar to bore through a 4-inch length; 1—¾-inch diameter bar to bore through 5½-inch length; 1—1¼-inch diameter boring bar to bore through a 7-inch length.



ABRASIVE belt sheet grinder with reciprocating table is designed for the finer finishing operations where more than one pass is required. Mattison Machine Works is the manufacturer

Steel Rate Down to 59; Outlook Is Clouded

Improved Railroad Demand Fails To Offset Continuing Drop in Automotive Releases—Strike Threat Imminent in Steel Industry—Scrap Prices off Sharply

SLACKENING in steel specifications, with some suspensions of material recently released by the automobile industry, and actual cancellations of orders for automobile parts by one of the leading manufacturers, resulted last week in a 3-point decline in steelworks operations to 59 per cent.

Neither the increase in demand from railroads and some miscellaneous manufacturing lines nor the incentive to manufacture for stock against the possibility of a general strike in the iron and steel industry proved sufficient to offset the reduction in automobile production and the lack of large-scale structural steelwork.

Finishing mill operations, especially in sheets and strip, have become disarranged, with some producers unable to accept any more specifications for delivery before June 30, and others with considerably more tonnage released for shipment in June than over the remainder of this month. The drop in specifications has not been disconcerting to many producers, who admittedly would have been unable to manufacture all the material they had contracted for, and who expected some concellations.

Strike Threat Is Disturbing Factor; Scrap Prices Off in All Districts

May 21 is the date set by the Amalgamated Association of Iron, Steel and Tin Workers for presenting demands for recognition, giving the industry three weeks in which to comply. While less than 10 per cent of all iron and steel wage earners are enrolled in trade unions, as calculated by steelmakers, the threat is disturbing, owing to the demonstrated ability of small minorities to impose their will by picketing and intimidation.

Striking at the foundation of the industry, labor organizers are threatening trouble in the Lake Superior iron ore district. This industry has been operating under the general steel code, and a hearing on an individual code is scheduled in Washington April 22. With more than 36,000,000 tons of iron ore in stock in upper and lower lake districts, and monthly consumption now around 2,500,000 tons, no difficulty is expected immediately from this source.

The uncertainties of the general iron and steel situation are reflected in further decline in prices of scrap in practically all centers, STEEL's iron and steel scrap composite this week off 37 cents to $11.21, a net reduction of $1.20 from the recent peak.

Current steel prices, incorporating recent advances, are likely to be extended into the third quarter on the majority of products when books are opened June 1, as under the steel code new prices to be effective that date would have to be filed May 21, and there has been no movement in that direction. An increase of $3 a ton in cold-finished steel bars is expected in June. Extension of the steel code itself from its expiration date May 31 is assured, with prospects for the establishment of some additional basing points and recognition of water shipments.

Chesapeake & Ohio Buys 35,000 Tons of Rails; 200 Freight Cars Awarded

Railroad purchases in the week included 35,000 tons of rails by the Chesapeake & Ohio and 200 70-ton hopper cars by the Central of Georgia. Chicago, Milwaukee, St. Paul & Pacific is to build 50 streamlined passenger and 25 baggage cars in its own shops. Twelve hundred freight cars still are pending.

Structural shape awards for the week, 17,178 tons, show little change from the preceding week. The steel industry does not expect to benefit from the $940,900,000 additional appropriation proposed by the President for public work until late in the year. The Great Lakes Pipe Line Co., Kansas City, Mo., has awarded 11,000 tons of 8⅝-inch steel pipe for a 189-mile line to the A. O. Smith Corp., Milwaukee.

STEEL'S London representative cables that British 33 1/3 per cent iron and steel import duties have been extended for five years.

Steelworks operations last week were up 1 point to 78 per cent, Cleveland; 4 to 84, New England; 1½ to 53½, Birmingham. They were down 5 to 74, Wheeling; ½-point to 64, Chicago; 5 to 62, Youngstown; and were unchanged at 100, Detroit; 51, Pittsburgh; 45, eastern Pennsylvania; 66, Buffalo. Tin plate operations increased 5 points to 75 per cent at Pittsburgh.

STEEL'S iron and steel price composite holds at $34.77, and the finished steel index $54.80.

COMPOSITE MARKET AVERAGES

	May 19	May 12	One Month Ago April, 1934	Three Months Ago Feb., 1934	One Year Ago May, 1933	Ten Years Ago May, 1924
Iron and Steel Composite	$34.77	$34.77	$34.18	$32.42	$28.45	$41.38
Finished Steel Composite	54.80	54.80	53.90	51.10	45.10	64.93
Steelworks Scrap Composite	11.21	11.58	12.15	11.72	9.23	10.91

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	May 19, 1934	April 1934	Feb. 1934	May 1933
Finished Material				
Steel bars, Pittsburgh	1.90	1.85	1.75	1.60
Steel bars, Chicago	1.95	1.90	1.80	1.70
Steel bars Philadelphia	2.19	2.15¼	2.04	1.91
Iron bars, Terre Haute, Ind.	1.75	1.60	1.60	1.65
Shapes, Pittsburgh	1.85	1.80	1.70	1.60
Shapes, Philadelphia	2.05½	2.01¾	1.90½	1.65
Shapes, Chicago	1.90	1.85	1.75	1.70
Tank plates, Pittsburgh	1.85	1.80	1.70	1.50
Tank plates, Philadelphia	2.03½	1.99¾	1.88½	1.49½
Tank plates, Chicago	1.90	1.85	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	2.00	1.90	1.75	1.55
Sheets, No. 24, hot ann., Pitts.	2.65	2.50	2.25	2.00
Sheets, No. 24, galvan., Pitts.	3.25	3.10	2.85	2.70
Sheets, No. 10, hot rolled, Gary	2.10	2.05	1.85	1.75
Sheets, No. 24, hot anneal., Gary	2.75	2.65	2.35	2.15
Sheets, No. 24, galvan., Gary	3.35	3.25	2.95	2.80
Plain wire, Pittsburgh	2.30	2.25	2.20	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.60	2.50	2.35	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	30.00	28.40	26.00	26.00
Sheet bars, open-hearth, Pitts.	30.00	28.40	26.00	26.00
Billets, open-hearth, Pittsburgh	29.00	27.80	26.00	26.00
Wire rods, Pittsburgh	38.00	37.20	36.00	35.00

	May 19, 1934	April 1934	Feb. 1934	May 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.56	19.26	16.66
Basic, Valley	18.00	17.60	17.00	14.40
Basic, eastern, del. eastern Pa.	19.76	19.51	18.76	15.44
No. 2 foundry, del. Pittsburgh	19.26	19.06	18.76	16.16
No. 2 foundry, Chicago	18.50	18.25	17.50	15.90
Southern, No. 2, Birmingham	14.50	14.25	13.50	12.00
No. 2X, Eastern, del. Philadelphia	20.63	20.38	19.63	15.95
Malleable, Valley	18.50	18.10	17.50	14.90
Malleable, Chicago	18.50	18.25	17.50	15.90
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.88	18.68	18.38	16.03
Ferromanganese, del. Pittsburgh	90.24	90.24	90.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$12.75	14.15	13.90	11.65
Heavy melting steel, eastern Pa.	11.00	11.50	11.75	9.50
Heavy melting steel, Chicago	11.00	11.75	10.90	8.70
No. 1 wrought, eastern Pa.	11.25	12.25	12.75	10.25
No. 1 wrought, Chicago	10.35	10.90	10.50	8.10
Rails for rolling, Chicago	12.25	12.75	11.90	10.25
Coke				
Connellsville, furnace, ovens	3.60	3.30	3.50	1.75
Connellsville, foundry, ovens	4.60	4.55	4.25	2.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	2.00c
Gary, base	2.10c
Chicago, del.	2.13c
New York, del.	2.33c
Philadelphia, del.	2.29c
Birmingham, base	2.15c
St. Louis, del.	2.32c
F.o.b. cars, dock Pacific ports	2.55c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.65c
Gary, base	2.75c
Chicago, del.	2.78c
Detroit, del.	2.85c
New York, del.	2.98c
Philadelphia, del.	2.94c
Birmingham, base	2.80c
St. Louis, del.	2.97c
F.o.b. cars, dock, Pacific ports	3.25c

GALVANIZED No. 24

Pittsburgh, base	3.25c
Gary, base	3.35c
Chicago, del.	3.38c
Philadelphia, del.	3.54c
New York, del.	3.58c
Birmingham, base	3.40c
St. Louis, del.	3.57c
San Francisco, f.o.b. cars, dock	3.85c

TIN MILL BLACK No. 28

Pittsburgh, base	2.85c
Gary, base	2.95c
St. Louis, del.	3.17c

COLD ROLLED No. 10

Pittsburgh, base	2.55c
Gary, base	2.65c
Detroit, delivered	2.75c
Philadelphia, del.	2.84c
New York, del.	2.88c

COLD ROLLED No. 20

Pittsburgh, base	3.15c
Gary, base	3.25c
Detroit, delivered	3.35c
Philadelphia, del.	3.44c
New York, del.	3.48c

ENAMELING SHEETS

Pittsburgh, No. 10	2.60c
Pittsburgh, No. 20	3.20c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.90c
Long ternes, No. 24 unassorted	3.65c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.85c
New York, del.	2.13c
Philadelphia, del.	2.03½c
Boston, del.	2.25c
Buffalo, del.	2.08½c
Chicago or Gary, base	1.90c
Cleveland, del.	2.03½c
Birmingham, base	2.00c
Coatesville, base	1.95c
Sparrows Pt., base	1.95c
Pacific Coast, f.o.b. cars, dock	2.40c
St. Louis, del.	2.12c

Structural Shapes

Pittsburgh, base	1.85c
Philadelphia, del.	2.05½c
New York del.	2.10½c
Boston, del.	2.23½c
Bethlehem, base	1.95c
Chicago, base	1.90c
Cleveland, del.	2.03½c
Buffalo, base	1.90c
Birmingham, base	2.00c
Pacific Coast, f.o.b. cars, dock	2.40c

Bars

SOFT STEEL

Pittsburgh, base	1.90c
Chicago or Gary, base	1.95c
Birmingham, base	2.05c
Buffalo, base	2.00c
Cleveland, base	1.95c
Detroit, del.	2.05c
Pacific Coast ports cars, dock, c.i.f.	2.45c
Philadelphia, del.	2.19c
Boston, del.	2.30c
New York, del.	2.23c
Pitts., forg. qual	2.05c-2.55c

RAIL STEEL

To Manufacturing Trade

Pittsburgh base	1.80c
Chicago or Gary, base	1.85c
Cleveland, base	1.85c
Buffalo, base	1.90c

IRON

Terre Haute, Ind. base	1.75c
Philadelphia, base..	1.99c
Pittsburgh, refined..	2.75c-7.50c

REINFORCING
New billet, cut lengths, carlots

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young....	2.10c
Gulf ports	2.45c
Pacific coast ports	3.00c
Philadelphia, del.	2.34c

Rail Steel

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland (Per 100-lb. keg)

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer..	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher. Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Shafting □ □ □

Turned and ground, Pitts. base

1⅛-inch	3.40c
1 7/16 to 1½-inch	2.90c
1 9/16 to 1⅞-inch	2.75c
1 15/16 to 2⅞-inch	2.60c
2 15/16 to 7-inch	2.45c

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 125-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr.. Ni., Van.	1.50
Carbon van.	0.95
9250 carbon base plus extras	

Strip and Hoops □

Hot strip to 23¾-in. Pittsburgh	2.00c
Do., Chicago	2.10c
Do., del. Detroit..	2.20c
Do., del. Phila.	2.29c
Do., del. N. Y.	2.33c
Cooperage hoop, Pittsburgh	2.10c
Do., Chicago	2.20c
Cold-rolled strip, Pitts., Cleve.	2.80c
Worcester, Mass.	3.00c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi..	$35.00
Do., reroll. qual...	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base..	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS
All sizes, cut thread, lag

Screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70 off
Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.00c
Struc., c. l., Chicago	3.10c
⅞-in. and smaller, Pitts., Chi., Cleve..	70 and 5 off
Wrought washers, Pitts., Chi., Phila..	6.25 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do. less than 5 kegs; no discount on size extras	$3.20
Steel piling, Pittsburgh	2.00c
Steel piling, Chi.. Buff	2.10c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD
Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD
Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE
Steel

⅛-inch, butt weld	50½
¼—⅜, buttweld	52½
½, butt weld	57½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES
C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES
Cold Drawn

2—2¼	27	3¼—3½	41
2½—2¾	34	4	43
3	38	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing dis. apply.)
Hot Rolled

2—2¼	33	3¼—3½	47
2½—2¾	40	4	49
3	44	4½, 5, 6	42

Quantity discounts: Carload and more gets preferentials of two 5%; 2000 to 999 pounds, 10 points off base and one 5%, under 2000 pounds, 15 points under base and one 5%.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$36.00-37.00
4-in., Birmingham..	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in., & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pitts., Chi., Cleve., and Youngstown..	$29.00
Philadelphia	34.3e
Forging, Pitts., Chi. and Buffalo	34.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O.	30.00

SLABS

Pitts., Cleve., Young.	29.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00

SKELP

All grades, Pitts. and Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

*Connellsville fur.	$3.60- 3.85
Connellsville fdry.	4.60
Connell. prem. fdy.	5.35
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.50
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.19
90 per cent benzol	$0.19
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do. (100 lbs.)	0.173c

Eastern Plants, Per Pound, In Barrels

†Naphthalene flakes and balls	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

†Western prices ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Sparrows Point, Md.	19.50	.....	19.00	.....
From Swedeland, Pa., del. to Phila.	20.26	20.76	19.76	.....
From Bethlehem, del. to Brooklyn	21.77	22.27	.....	.....
From Bethlehem, del. to Newark, N. J.	20.89	21.39	.....	.....
Basing Point:				
Everett, Mass.	19.50	20.00	19.00	20.50
From Everett, del. to Boston	20.00	20.50	19.50	21.00
Basing Point:				
Buffalo	18.50	19.00	17.50	19.50
From Buffalo, del. to Boston	20.00	20.50	19.50	21.00
Basing Points:				
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, O.	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
From Detroit, del. to Saginaw, Mich.	20.60	20.60	20.10	21.10
From Cleveland, del. to Akron, Canton, O.	19.76	19.76	19.26	20.26
From Toledo, del. to Mansfield, O.	20.26	20.26	19.76	20.76
Basing Point:				
Jackson, O.	20.25	20.25	19.75	.....
Hamilton, O.	18.50	18.50	18.00	.....
From Hamilton, del. to Cincinnati	19.51	19.51	19.01	.....
Do., del. to Indianapolis	20.77	20.77	20.27	21.27
Basing Points:				
Duluth	19.00	19.00	.....	19.50
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	19.00	18.00	.....
From Duluth, del. to St. Paul	20.94	20.94	.....	21.44
From Chicago, del. to Milwaukee	19.50	19.50	19.00	20.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	21.40	21.40	20.90	21.90
From Granite City, del. to St. Louis	19.00	19.50	18.50	.....
Basing Point:				
†Birmingham, Ala.	14.50	.....	13.50	19.00
From Birmingham, del. to:				
Boston	19.62	.....	19.50	.....
Newark, N. J.	20.51	.....	.....	.....
Brooklyn, N. Y.	21.39	.....	.....	.....
Baltimore	20.02	.....	19.90	.....
Philadelphia	19.88	.....	19.76	.....
Cleveland	18.62	.....	18.50	.....
Cincinnati	19.13	.....	19.01	.....
Chicago	††18.72	.....	18.60	.....
St. Louis	18.62	.....	18.50	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron. ††Over 0.70 phos.

Basing Point:
Provo, Utah ..... 17.50 ..... 17.00 .....

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50
†Off grade material is $19.50

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	21.00
Pitts. dist. fur.	17.75	Do., del. Chicago	24.04

SILVERY

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.75; 10—$26.75; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore

LAKE SUPERIOR ORE
Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES
Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE
Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%.	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.25-17.75
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%	24.00
So. Afr., 49-51%	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK
First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK
Net ton, f.o.b. Baltimore, Plymouth Meeting, Pa. Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid. tide, net ton	$19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$17.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom. fur. spot†	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload.	85.00
Do., 75 per cent. Spot, $5 a ton higher.	126-130.00
Silicomang., 2½ carb.	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.50c *Conn. copper*

Sheets

Yellow brass (high)	14.25
Copper, hot rolled	15.50
*Lead, cut, to jobbers	7.75
Zinc, 100-lb. base	9.00

Tubes and Pipes

High yellow brass	16.75
Seamless copper	16.75

Rods

High yellow brass	12.75
Copper, hot rolled	12.75

Anodes

Copper untrimmed	13.25

Wire

Yellow brass (high)	14.75

Old Metals

Deal, buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.75- 5.00
Chicago	4.62½-4.87½
*Cleveland	5.00- 5.25
St. Louis	5.00- 5.25
Heavy Copper and Wire	
New York	6.25-6.37½
Chicago, No. 1	5.87½-6.12½
Cleveland	6.00- 6.25
St. Louis	6.00- 6.25
Composition Brass Borings	
New York	4.50- 4.75
Light Copper	
New York	5.37½-5.62½
Chicago	4.62½-4.87½
*Cleveland	5.00- 5.25
St. Louis	5.25- 5.50
Light Brass	
Chicago	2.62½-2.87½
*Cleveland	2.75- 3.00
Lead	
*New York	3.00- 3.25
*Cleveland	3.00- 3.25
Chicago	3.00- 3.25
*St. Louis	3.00-3.25
Zinc	
New York	2.25- 2.50
*Cleveland	2.25- 2.50
St. Louis	2.75-3.00
Aluminum	
Clips, soft, Clev.	13.00-13.50
Borings, Cleveland	7.00- 7.25
Mixed, cast, Cleve.	11.00-11.25
*Remelt al. St. No. 12	15.50

Secondary Metals

Brass ingot, 85-5-5-5	8.75
Remelt al. No. 12	14.50-16.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL	□
Birmingham	10.00-10.50
Boston, dealers	6.75- 7.00
Buffalo, No. 1	12.00-13.00
Buffalo, No. 2	10.50-11.50
Chicago, No. 1	10.75-11.00
Cleveland, No. 1	10.50-11.00
Cleveland, No. 2	10.00-10.50
Detroit, No. 1	9.00- 9.50
Detroit, No. 2	8.00- 8.50
Eastern Pa.	11.00
Eastern Pa., No. 2	8.50- 9.00
Federal, Ill.	8.00- 8.50
Granite City, R. R.	8.50- 9.00
Granite City, No. 2	7.00- 7.50
N. Y., deal. R. R.	8.50
N. Y., deal. No. 2	7.00
Pittsburgh, No. 1	12.50-13.00
Valleys, No. 1	12.50-13.00
COMPRESSED SHEETS	□
Buffalo, dealers	10.50-11.50
Chicago, factory	9.50-10.00
Cleveland	10.25-10.75
Detroit	9.00- 9.50
E. Pa., new mat.	10.00-10.50
Pittsburgh	12.25-12.75
St. Louis	7.50- 8.00
Valleys	12.00-12.50
BUNDLED SHEETS	□ □
Buffalo	7.50- 8.00
Cincinnati, del.	7.00- 7.50
Cleveland	8.50- 9.00
Pittsburgh	11.25-11.75
St. Louis	5.50- 6.00
SHEET CLIPPINGS LOOSE	□
Chicago	5.50- 6.00
Cincinnati	6.50- 7.00
Detroit	5.25- 5.75
St. Louis	5.25- 5.75
STEEL RAILS, SHORT	□
Birmingham	12.00-12.50
Buffalo	14.00-14.50
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	12.50-13.00
Cincinnati, del.	11.50-12.00
Detroit	11.00-11.50
Pitts., open-hearth, 3 ft. and less	14.75-15.25
St. Louis, 2 ft. & less	13.00-13.50
STEEL RAILS, SCRAP	□
Boston	6.25- 7.00
Chicago	10.75-11.00
Pittsburgh	12.25-12.75
STOVE PLATE	□ □
Birmingham	6.50- 7.00
Boston, dealers	4.75- 5.00
Buffalo	10.75-11.00
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Detroit, net	7.00- 7.50
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	6.50- 7.00
COUPLERS, SPRINGS	□
Buffalo	13.75-14.25
Chicago, springs	12.00-12.50
Eastern Pa.	14.00-14.50
Pittsburgh	14.75-15.25
St. Louis	6.25- 6.75

ANGLE BARS—STEEL	□
Chicago	12.00-12.50
St. Louis	9.00- 9.50
LOW PHOSPHORUS	□ □
Buffalo, billets and bloom crops	14.00-14.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa. crops	15.00-15.50
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	14.50-15.00
FROGS, SWITCHES	□ □
Chicago	10.75-11.00
St. Louis, cut	9.00- 9.50
SHOVELING STEEL	□ □
Chicago	10.75-11.00
Federal, Ill.	8.00- 8.50
Granite City, Ill.	7.00- 7.50
RAILROAD WROUGHT	□
Birmingham	6.50- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	9.50-10.00
Buffalo, No. 2	12.50-13.00
Chicago, No. 1 net	9.00- 9.50
Chicago, No. 2	10.75-11.00
Cincinnati, No. 2	8.25- 8.75
Eastern Pa.	11.00-11.50
N. Y., No. 1 deal.	8.00- 8.50
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	8.00- 8.50
SPECIFICATION PIPE	□
Boston	4.50- 4.75
Eastern Pa.	9.00
New York, dealers	5.25- 5.50
BUSHELING	□ □
Buffalo, No. 1	10.50-11.50
Chicago, No. 1	9.50-10.00
Cinci., No. 1 deal.	6.25- 6.75
Cincinnati, No. 2	4.50- 5.00
Cleveland, No. 2	8.25- 8.50
Detroit, No. 1 new	8.00- 8.50
Valleys, new No. 1	12.00-12.50
MACHINE TURNINGS	□
Bimingham	4.50- 5.00
Boston, dealers	3.00- 3.50
Buffalo	6.25- 6.50
Chicago	650- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	8.25- 8.50
Detroit	5.50- 6.00
Eastern Pa.	7.00
New York, dealers	3.25- 3.50
Pittsburgh	8.50- 9.00
St. Louis	4.00- 4.50
Valleys	9.00- 9.50
BORINGS AND TURNINGS	□
For Blast Furnace Use	
Boston, dealers	3.25- 3.50
Buffalo	7.75- 8.25
Cincinnati, dealers	5.00- 5.50
Cleveland	8.25- 8.50
Detroit	6.75- 7.25

Eastern Pa.	6.00
New York, dealers	2.00- 2.50
Pittsburgh	8.25- 8.75
CAST IRON BORINGS	□ □
Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Chicago	6.50- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	8.25- 8.50
Detroit	6.75- 7.25
E. Pa., chemical	12.00-15.00
New York, dealers	3.00- 3.50
Pittsburgh	8.25- 8.75
St. Louis	4.25- 4.75
PIPE AND FLUES	□ □
Cincinnati, dealers	4.75- 5.25
RAILROAD GRATE BARS	□
Buffalo	7.00- 7.50
Chicago, net	7.25- 7.75
Cincinnati	5.50- 5.75
Eastern Pa.	9.00
New York, dealers	5.00- 5.50
St. Louis	6.00- 6.50
FORGE FLASHINGS	□ □
Boston, dealers	4.50- 4.75
Buffalo	11.00-11.50
Cleve., over 10 in.	9.25- 9.75
Detroit	8.00- 8.50
FORGE SCRAP	□ □
Boston, dealers	4.50- 4.75
Chicago, heavy	12.00-12.50
Eastern Pa.	10.50-11.00
ARCH BARS, TRANSOMS	□
St. Louis	11.25-11.75
AXLE TURNINGS	□ □
Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.50
Chicago, elec. fur.	10.25-10.75
Cleveland	9.25- 9.75
Eastern Pa.	11.00
St. Louis	7.00- 7.50
STEEL CAR AXLES	□ □
Birmingham	10.50-11.50
Boston, ship, point.	9.00- 9.50
Buffalo	13.00 13.50
Chicago, net	11.75-12.25
Eastern Pa.	14.00-15.00
St. Louis	11.00-11.50
SHAFTING	□ □
Boston, ship. point.	11.00-11.25
Eastern Pa.	16.00
New York, dealers	11.50-12.00
St. Louis	12.50-13.00
CAR WHEELS	□ □
Birmingham, iron	9.50-10.00
Boston, iron deal.	6.50- 6.75
Buffalo, iron	12.25-12.75
Buffalo, steel	13.75-14.25
Chicago, iron	11.50-12.00

Chicago, rolled steel	12.00-12.50
Cincinnati, iron	9.00- 9.50
Eastern Pa., iron	12.50-13.00
Eastern Pa., steel	14.00-14.50
Pittsburgh, iron	11.75-12.25
Pittsburgh, steel	14.75-15.25
St. Louis, iron	8.25- 8.75
St. Louis, steel	9.00- 9.50
NO. 1 CAST SCRAP	□ □
Birmingham	9.50-10.50
Boston, No. 2	5.50- 6.00
Boston, tex. con.	10.50-11.00
Buffalo, cupola	10.50-11.50
Buffalo, mach.	12.00-12.50
Chicago, agri. net	8.00- 8.50
Chicago, mach. net	9.00- 9.50
Chi., railroad net	8.75- 9.25
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	12.00-12.50
Detroit, net	9.00- 9.50
Eastern Pa., cupola	12.00-12.50
Pittsburgh, cupola	12.00-12.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.25- 8.75
St. L., No. 1 mach.	10.00-10.50
HEAVY CAST	□ □
Boston, del.	6.50- 6.75
Buffalo, break.	9.00- 9.50
Cleveland, break.	8.25- 8.75
Detroit, break	7.00- 7.50
Detroit, auto net	10.00-10.50
Eastern Pa.	11.00
N. Y., No. 1, deal.	7.00- 7.50
N. Y., break. deal.	7.00- 7.50
Pittsburgh	11.00-11.50
MALLEABLE	□ □
Boston, consum.	12.50-12.75
Buffalo	13.25-13.75
Chicago, R. R.	12.00-12.50
Cincinnati, agri. del.	9.00- 9.50
Cinci., R. R. del.	10.00-10.50
Cleveland, rail.	13.00-13.50
Detroit, auto	9.25- 9.75
St. Louis, R. R.	9.50-10.00
Eastern Pa., R. R.	11.50-12.00
RAILS FOR ROLLING	□
5 feet and over	
Birmingham	10.50-11.50
Boston, dealers	7.00- 7.25
Buffalo	12.00-12.50
Chicago	12.00-12.50
Eastern Pa.	12.00-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50
LOCOMOTIVE TIRES	□
Chicago (cut)	12.00-12.50
St. Louis, No. 1	9.75-10.25
LOW. PHOS. PUNCHINGS	□
Buffalo	13.75-14.25
Chicago	12.00-12.50
Eastern Pa.	14.50-15.00
Pittsburgh	14.50-15.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Nickel Ingot
May 12	8.50	8.62½	8.25	54.00	53.87½	4.25	4.10	4.35	*22.90	8.60	36.00
May 14	8.50	8.62½	8.25	53.10	53.97½	4.25	4.10	4.35	*22.90	8.60	36.00
May 15	8.50	8.62½	8.25	53.00	52.97½	4.25	4.10	4.35	*22.90	8.60	36.00
May 16	8.50	8.62½	8.25	53.10	53.07½	4.25	4.10	4.35	*22.90	8.50	36.00
May 17	8.50	8.62½	8.25	53.70	53.67½	4.15	4.00	4.35	*22.90	8.50	36.00
May 18	8.50	8.62½	8.25	53.15	53.12½	4.00	3.85	4.35	*22.90	8.50	36.00

*Nominal range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	□
Baltimore*	3.00c
Boston††	3.05c
Buffalo	2.95c
Chattanooga	3.41c
Chicago	3.05c
Cincinnati	3.25c
Cleveland	3.05c
Detroit	3.13½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.40c
New York‡(d)	3.32c
Pittsburgh(h)	3.00c
Philadelphia*	3.00c
San Francisco	3.60c
Seattle	3.40c
St. Louis	3.29c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Portland	3.40c
Baltimore*	3.00c
Chattanooga	3.41c
Chicago	2.75c
Cincinnati	3.25c
New York‡(d)	3.32c
Philadelphia*	3.00c
St. Louis	3.29c
Tulsa	3.25c

REINFORC. BARS	□
Buffalo	1.95c
Chattanooga	3.41c
Chicago	2.10c-2.60c
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.15c
Pitts., twisted squares (h)	3.27½c
San Francisco	2.45c
Seattle	2.65c
St. Louis	3.44c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	□
Baltimore*	3.00c
Boston††	3.22c
Buffalo	3.20c
Chattanooga	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland	3.36c
Detroit	3.45c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.60c
New York(d)	3.42c
Philadelphia*	3.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore*	3.00c
Boston††	3.23c
Buffalo	3 20c
Chattanooga	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland, ¼-in. and over	3.36c
Detroit	3.30c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.60c
New York(d)	3.45c
Philadelphia*	3.00c
Phila. floor	5.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore*	3.20c
Boston††	3.40c
Buffalo	3.10c
Chattanooga	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Det., 8-10 ga.	3.28½
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.70c
New York	3.42c
Portland	3.75c
Philadelphia*	3.20c
Pittsburgh(h)	3.10c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.44c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	□
Baltimore*†	3.76c
Boston (g)	4.15c
Buffalo	3.25c
Chattanooga	4.41c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	4.16c
Detroit	4.185c
Los Angeles	4.35c
New York	4.05c
Philadelphia*†	3.80c
Pittsburgh**	3.80c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Baltimore*†	4.36c
Buffalo	4.00c
Boston (g)	4.75c
Chattanooga	5.01c
Chicago (h)	4.70c
Cincinnati	4.85c
Cleveland	4.76c
Detroit	4.85c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.25c
Pitts.** (h)	4.30-4.60c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.40c

BANDS	□
Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.76c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.51c
Detroit, ⅜-in. and lighter	3.53½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.95c
New York(d)	3.77c
Philadelphia	3.30c
Pittsburgh(h)	3.85c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.69c

HOOPS	□
Baltimore	2.80c
Boston	4.40c
Buffalo	3.55c
Chicago	3.45c
Cincinnati	3.60c
Det., No. 14 and lighter	3.53½c
New York	3.77c
Philadelphia	3.55c
Pittsburgh(h)	3.85c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	5.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	5.25c
Chicago (b)	3.45c
Cincinnati	5 80c
Cleveland (b)	3.20c
Detroit	3.33c
Philadelphia	4.00c
New York	4.70c
St. Louis	5.74c

(b) Plus straightening, cutting and quantity differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff
(e) New mill classif
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery. 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 17

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d		Continental Channe lor North Sea ports, metric tons Gold parity, $4.8665 £ s d	
PIG IRON				
Foundry, 2.50-3.00 Silicon	$15.33	3 0 0	$8.03	1 13 0
Basic bessemer	13.80	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	15.71	3 1 6	....	.....
SEMIFINISHED STEEL				
Billets	$28.11	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	39.86	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$39.60	7 15 0	$26.77	5 10 0
Merchant bars	1.71c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.68c	7 7 6	.63c to .66c	2 17 6 to 3 0 0
Plates, †¼ in. or 5 mm	1.82c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm	2.11c	9 5 0	1.24c to 1.27c	5 12 6 to 5 15 0
Sheets, gal., 24 gage, corr	2.57c	11 5 0	1.43c	6 10 0
Bands and strips	1.88c	8 5 0	.88c	4 0 0
Plain wire, base	2.22c	9 15 0	1.18c	5 7 6
Galvanized wire, base	2.62c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.74c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs	$ 4.41	0 17 3	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$17.25	3 7 6(a)	$12.58	190	$13.84	295	$24.98	63
Basic bessemer pig iron	16.61	3 5 0(a)*	12.25	185	13.60	290	27.56	(b)69.50
Furnace coke	4.47	0 17 6	7.94	120	5.16	110	7.63	19.25
Billets	28.11	5 10 0	28.47	430	20.64	440	38.26	96.50
Standard rails	1.88c	8 5 0	2.10c	700	2.31c	1,100	2.38c	132
Merchant bars	1.96c	8 12 0	1.68c	560	1.16c	550	1.98c	110
Structural shapes	2.00c	8 15 0	1.65c	550	1.16c	550	1.94c	107.50
Plates, †¼-in. or 5 mm	1.93c	8 10 0	2.10c	700	1.47c	700	2.29c	127
Sheets, black	2.39c	10 10 0§	2.55c	850‡	1.63c	775‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.96c	13 0 0	4.50c	1,500	3.15c	1,500	6.66c	370
Plain wire	2.22c	9 15 0	3.39c	1,130	2.31c	1,100	3.11c	173
Bands and strips	2.39c	10 10 0	1.95c	650	1.47c	700	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 56

Pittsburgh—Merchant steel bar buying is smaller by forging shops, automobile partsmakers and nonintegrated cold-drawn bar finishers. However, the farm implement trade still buys fairly heavily. The merchant steel bar market is 1.90c base, Pittsburgh, alloy bars are 2.55c and merchant rail steel bars are now 1.80c, Pittsburgh.

Cleveland—Current prices, incorporating advances announced in April, are to carry into third quarter, with books to be opened for that period June 1. Under the steel code, further changes to be effective June 1 would have to be filed May 21. There is some discussion of the possibility of advancing the Detroit price differential on steel products, now $3 a ton over the Pittsburgh base, when the steel code is amended in some details and extended. Specifications from the automobile industry are slowing up from the peak reached early this month; releases from other manufacturing industries are well sustained.

Chicago—Automotive requirements for steel bars are lighter and are expected to moderate further. Requirements of other consumers are fairly steady with bar mill operations aided by fair shipments of reinforcing material. Demand from farm implement manufacturers is holding well.

Boston — Commercial steel bar specifications have dropped slightly, although alloy and forging bars hold to the current rate. Despite attempts to urge buyers to specify for shipment in early June, specifications, although fairly numerous, are light.

Philadelphia — Commercial steel bar releases are better than a week ago but still disappointing to most sellers here. Due in no small measure to heavy releases in the Middle West over recent weeks, rolling schedules are likely to be well taken up within another fortnight or so, it is said here. Prices are 1.90c, Pittsburgh, or 2.19c, Philadelphia.

Plates

Plate Prices, Page 56

Pittsburgh—Plate buying from tank makers is slow, and the market generally is not as active as recently. Pittsburgh base on plates continues 1.85c. Army engineers at Pittsburgh took bids recently on 32 steel buckle plates for lock No. 7, Ohio river, at Midland, Pa.

Cleveland—Some nearby railroad car builders are releasing additional tonnages of plates but comparatively little of this tonnage will be shipped from Cleveland. Small construction jobs and miscellaneous requirements provide a fair tonnage. Demand from tank builders is quiet.

Chicago—Plate orders from railroads and railroad equipment builders show further improvement but tank fabricators' requirements still are light. Placing of a 189-mile pipe line with the Milwaukee producer will involve 11,000 tons of plates.

Boston—Plate specifications hold well, but are largely concentrated for cars and tanks, a growing number of the latter coming up for bids. Miscellaneous plate buying is fair, including boiler shop requirements. Some small new business has been done at 1.95c, Coatesville, Pa.

New York—While plate specifications have lagged, there is now some improvement, with current activity stimulated by several hundred tons of railroad equipment releases.

Philadelphia—Reading Co. is releasing several hundred tons of plates for car repair work. Specifications against quarterly contracts continue to lag, with some mills building up ingot stocks. The market is 1.95c, Coatesville, or 2.03½c, delivered, Philadelphia.

Contracts Placed

2500 tons, tunnel lining for metropolitan water district, Los Angeles, to Commercial Shearing & Stamping Co., Los Angeles.

1060 tons, three 93,000-barrel cone roof tanks, Sinclair Refining Co., Marcus Hook, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

1025 tons, two floating roof 93,000-barrel tanks, East Chicago, Ind., and one floating roof tank 93,000-barrel, Marcus Hook, Pa., for Sinclair Refining Co., to Chicago Bridge & Iron Works, Chicago.

550 tons, 50 small 11-ton steel pontoons for Louisville, Ky., engineers, to Ingalls Iron Works, Birmingham, Ala., at $61,900 on welded basis. McClintic-Marshall Corp., Bethlehem, Pa., second low at $72,000 on riveted basis.

500 tons, ½-inch, Seattle seawall water pipe improvement, to Garrett & Shafer Engineering Works, Seattle.

290 tons, 22-inch welded pipe, metropolitan water district, Los Angeles, to Southern Pipe & Casing Co., Los Angeles.

250 tons, gas holder, Richmond, Va., to Stacey Bros., Cincinnati.

209 tons, 150 pieces of welded pipe, each 5 x 20 feet, ½-inch plates, plus pipe flanges, for Louisville, Ky., engineers, to Midland Barge Co., Midland, Pa., at $16,763, Midland, Pa., or $17,700, delivered, Paducah, Ky.

Contracts Pending

1500 tons, 20 to 30-inch welded steel pipe for east bay municipal utility district, Oakland, Calif., specification No. LS 120; bids May 23.

1000 tons, Parker dam on Colorado river, Colorado; bids about July 1.

200 tons, standpipe, state farm, Bridgewater, Mass., awaiting approval of PWA.

170 tons, Ediz Hook, Wash., coast guard hangar; George Hoss, Los Angeles, low.

91 tons, steel sheet piling; bids to R. R. Tinkham, superintendent seventeenth lighthouse district, Portland, Oreg., May 17.

Unstated tonnage, 150,000-gallon and 10,000-gallon tank, Elizabeth, W. Va.; Bernard G. Sampson Co., Fairmont, W. Va., engineer; bids soon; considerable 8-inch and under cast pipe to be bought for water line extension.

Unstated tonnage, 120,000-gallon and 10,000-gallon tank, Littleton, W. Va.; Bernard G. Sampson Co., Fairmont, W. Va., engineers; bids soon.

Sheets

Sheet Prices, Page 56

Cleveland—Sheet producers are having difficulty in obtaining from automobile manufacturers specifications in sufficient volume to indicate that all material contracted for second quarter will be taken out. The reduction in assemblies and the reluctance of some automobile interests to stock sheets now makes it appear that some cancellations will be inevitable. A few sheet producers note suspensions of specifications previously issued, but say the tonnage is comparatively light. On the other hand, some leading sheetmakers report their releases last week were larger than in the week preceding. Shipments to manufacturers of refrigerators and stoves continue heavy. The strike threat in the steel industry seems to center in sheet departments, and it is understood 80 per cent of the employes in some nearby sheet mills are organized.

Republic Steel Corp., Youngstown, O., has been awarded 1425 squares of galvanized corrugated No. 26 gage sheet steel for the quartermaster depot, Jeffersonville, Ind. Each sheet is 26 x 84 inches.

Boston—Industrial users are ordering slightly more tonnage, with galvanized sheets showing a slight gain over other grades.

Pittsburgh—Sheet orders still exceed the current 60 per cent rate of operation in district sheet mills, with good demand from farm implement manufacturers, for railroad car repairs. The only disappointing note is a curtailment in sheet specifications from automobile manufacturers. There appears to be some question now whether all producers will be

able to roll and ship all their second-quarter contract obligations before July 1, but in the meantime some buyers are counted on to cancel at least part of their contracts.

New York—Sheet sellers here are fast approaching the point where they will be unable to accept further specifications for this quarter. Certain sellers are virtually out of the market, while others expect to be in a similar position within another week or so. Snead & Co., Jersey City, N. J., will require 200 tons of sheets for shelving, for the interstate commerce commission building, Washington.

Philadelphia—Due particularly to heavy releases in the Middle West, sheet mill representatives here report that they are, or shortly will be unable to accept further specifications for this quarter. Specifications from the eastern districts are now increasing. One interest here estimates that close to 60 per cent of what might be expected for this quarter has been brought out. Prices are unchanged. Dillon Supply Co., Raleigh, N. C., has booked 200 tons of tag stock for North Carolina, for delivery in this quarter.

Cincinnati — Sheet specifications are lighter, due principally to curtailment from the automotive industry. Shipments to stovemakers have improved and manufacturers of other household appliances continue to draw heavily against contracts.

St. Louis—Sheet producers and distributors report incoming business in slightly smaller volume, but specifications from all classes of consumers still are on a satisfactory basis. Further expansion through the South is noted in demand for galvanized sheets.

Wire

Wire Prices, Page 57

Pittsburgh—Wire mills continue to build up stocks of finished wire products to enable immediate shipment. For spot business the market on nails is $2.60, Pittsburgh, on plain wire 2.30c, on annealed fence wire 2.45c, and on galvanized barbed wire 3.00c.

Cleveland—Specifications for wire and wire products are lighter than in any week since the heavy buying which preceded price advances for second quarter. The slowing trend is noted chiefly in demands from the auomotive industry. Recession in automobile production which affected nut and bolt manufacturers is now reflected in wire shipments to those manufacturers. Producers, however, believe that most material contracted for this quarter will be shipped before July 1.

Chicago—While wire specifications and shipments are fairly steady, requirements of the automotive industry are declining and the outlook in farm districts is becoming less favorable. Activity in manufacturers' wire still is relatively better than in various wire products. New business is light, with wire nails continuing $2.65 and plain wire 2.35c.

Boston—Wire specifications continue brisk. Finishing operations show little change and in some instances mills are stocking moderately.

Philadelphia—Wire mills are commencing to fill up rapidly. On some descriptions, sellers expect to be out of the market for this quarter by the end of this month. Spring wire and manufacturers' wire are moving particularly well.

Railroads

Track Material Prices, Page 57

Chesapeake & Ohio has distributed 35,000 tons of rails to four makers and the Reading is expected to announce placing of 10,000 tons shortly. Little further rail tonnage remains to be placed.

Central of Georgia has awarded 200 hoppers of 70 tons capacity to the Bessemer, Ala., plant of the Pullman Car & Mfg. Corp. Pending car inquiries include 1000 box cars for the Seaboard Air Line, 150 hoppers for the Pittsburgh, Shawmut & Northern, 20 cabooses for the Western Maryland and 600 cement containers for a less-carload corporation.

Chicago, Milwaukee, St. Paul & Pacific has started construction at its West Milawukee shops of 50 welded type streamlined passenger coaches and 25 baggage cars. Delaware, Lackawanna & Western has been granted a PWA loan of $1,043,000 to convert 20 road locomotives into switchers and 986 wooden box cars into steel sheathed.

Railroads are taking various steel products in steady volume for car and other repair work and equipment builders are also fairly heavy buyers.

Car Orders Placed

Central of Georgia, 200 hoppers, 70-ton capacity, to Pullman Car & Mfg. Corp., Bessemer, Ala., shops.

Chicago, Milwaukee, St. Paul & Pacific, 50 welded type streamlined passenger coaches and 25 baggage cars, to own shops; PWA loan of $1,716,000 received.

Locomotives Placed

Chilean State Railways, five locomotives, to Baldwin Locomotive Works, Eddystone, Pa.; this is in addition to five noted as placed in March and corrects a typographical error in last week's issue.

Rail Orders Placed

Chesapeake & Ohio, 35,000 tons, rails, distributed as follows: Illinois Steel Co., 15,085 tons; Inland Steel Co., 11,900 tons; Carnegie Steel Co., 4515 tons; Bethlehem Steel Co., 3500 tons.

Car Orders Pending

Chief of engineers, Washington, two gasoline mechanical motor rail cars, Northwest Motor Co., Eau Claire, Wis., low; bids May 7.

Rail Orders Pending

Grand Trunk Western, 4250 tons; PWA loan of $250,000 approved.

Strip Steel

Strip Prices, Page 57

Pittsburgh—A falling off in strip buying has been of distinct benefit to producers who now are afforded some leeway in producing and shipping all of second-quarter contract obligations. Therefore, it is likely that a test of asking price of 2.80c, Pittsburgh, base, on cold-rolled strip and 2.00c, Pittsburgh, base, on hot-rolled strip may be made sooner than expected in the third quarter.

Cleveland—Despite a decrease in tonnage releases from the automotive industry, and some decline in specifications from other users, strip mills have been able to maintain practically full operations. Some producers now have a larger volume of specifications in hand for June shipment than they have for the remainder of this month; their schedules are filled up for June, while they have facilities available to give immediate delivery.

Chicago—Strip specifications are declining and the outlook is less favorable than a month ago. While reduced automotive requirements are chiefly responsible the tendency in needs of other users also is downward. Backlogs are sufficient to maintain operations at a fairly high rate over the remainder of the quarter, however.

Boston—Strip mill operations continue high, largely in narrower widths, including plain-cold-rolled, annealed and special finishes. Indications are that most of the tonnage under contract for second quarter

will be taken out. Cold strip on new business is firm at 3.00c, Worcester.

New York—Strip sellers expect to be virtually out of the market for this quarter within the next week or so. Prices are 2.33c, delivered, New York, for hot-rolled and 3.13c, for cold-rolled.

Philadelphia—Local strip representatives are exerting pressure upon customers to get specifications in at once. By another fortnight, it appears, it will be almost impossible for any more specifications to be received for shipment this quarter. The market is 2.29c, Philadelphia, for hot strip and 3.09c for cold.

Warehouse

Warehouse Prices, Page 60

Pittsburgh—Volume of warehouse steel shipments at Pittsburgh holds steady. Proportionately, however, out-of-Pittsburgh deliveries are heavier. No change in price has occurred.

Cleveland—Warehouse business is fairly satisfactory, with some leading sellers noting a slight gain in the number of orders this month compared with the same April period, but a slight loss in tonnage.

Chicago—Sales by warehouses are declining earlier than usual in this quarter, intensified by forward coverage before recent price advances, but are heavier than a year ago. Prices are unchanged.

Boston—While small orders are numerous, total tonnage with Boston warehouses lags behind last month.

New York—Aggregate tonnage by most of the larger warehouse distributors is at least holding to the recent rate and in some instances gains have been made over last month.

Philadelphia—Since the recent bulge before the advances in prices, warehouse trading has fluctuated little but total volume is far below normal for this season of the year.

Detroit—Cold-rolled strip steel, steel bars and turned and ground shafting were advanced by warehouses here last week. Cold-rolled strip is based on 3.05c, Cleveland, making the new Detroit price 3.33c, plus mill extras. Alloy bars are 6.05c and 7.15c according to series. Shipments are heavy.

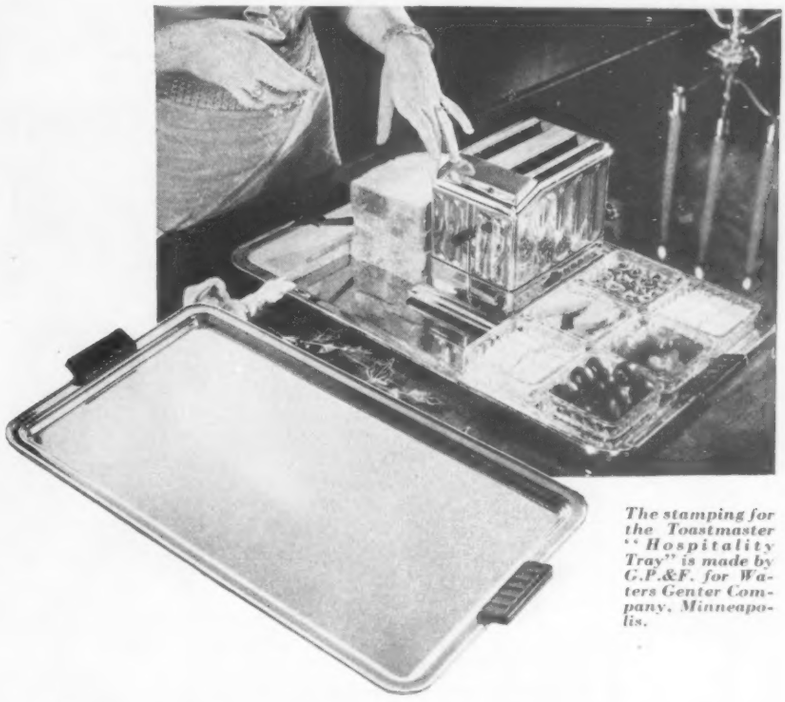
Cincinnati—Tonnage from warehouse is being maintained. The seasonal upturn in demand for building and road improvement materials has been slight.

St. Louis—Volume of warehouse business has varied only slightly during the past week. Demand holds up well, particularly in flat rolled items.

Semifinished

Semifinished Prices, Page 57

Demand for semifinished steel improved last week. Most of the demand for billets is coming from the heavy drop forgers, whose orders frequently are for 1000 and 1500-ton lots. Forging quality billets hold at $34, Pittsburgh, with plain billets, sheet bars and slabs $29, base Pittsburgh. Improvement in skelp is due to noteworthy activity among the small butt-weld pipe makers. Skelp is 1.70c base, Pittsburgh. Tube rounds hold at 1.90c; and wire rods at $38, Pittsburgh or Cleveland.



The stamping for the Toastmaster "Hospitality Tray" is made by G.P.&F. for Waters Genter Company, Minneapolis.

An Idea—plus G. P. & F. Stampings Sold More Toastmasters

With the "Hospitality Tray" idea added,—the Toastmaster now gives many extra hours of convenience in the home. Thus has a famous product been improved by stampings—G.P.&F. was able to make a tray of such large dimensions *perfectly flat*.

Multiplying the sales of an established product by increasing its usefulness, its beauty, or its convenience, is a common thing with G.P.&F. With 53 years experience under one management to draw upon—with 19 acres of floor space containing every modern stamping facility G.P.&F. has succeeded in materializing many ideas,—many that were judged impractical elsewhere.

Let G.P.&F. engineers have a chance to suggest improvements on your product. Perhaps it needs a "hospitality tray". If you already have an idea, G.P.&F. engineers can help cut the time from plan to market.

Take advantage of G.P.&F. experience and facilities. Start by writing for the idea-inspiring booklet *"In Harmony with Modern Progress"*.

GEUDER, PAESCHKE & FREY CO.
Sales Representatives in Principal Cities in All Parts of the Country
1437 W. St. Paul Ave., Milwaukee, Wis.
380 W. Ohio St., Chicago, Ill.

G.P.&F. STAMPINGS

NRA

Shapes

Structural Shape Prices, Page 56

Pittsburgh—Railroad bridge inquiry is slightly more active. No award has been made on the 5000-ton strip mill at Struthers, O., for Youngstown Sheet & Tube Co., although bids were taken ten days ago. Awards include the 1300-ton Fifth regiment armory at Baltimore, and a 680-ton bascule span at Norfolk, Va. The market holds at 1.85c, Pittsburgh, on structural shapes, and 2.00c, base, Pittsburgh, on piling. An advance in piling, however, will be made soon.

Cleveland—Railroad bridge work predominates in the market. Nickel Plate railroad has awarded 1200 tons for a bridge at Palmyra, N. Y., to McClintic-Marshall Corp. here. Erie railroad is taking bids on bridges at Allegheny, Big Tree and Dayton, N. Y., total requirements being 1000 tons. The Ohio highway commission is taking bids May 25 on 159 tons for a bridge in Warren county.

Chicago—Structural shape inquiries and awards continue at the low levels prevailing the past several weeks. Individual orders are limited to a few hundred tons at a time, while inquiries are few. Some state bridge work continues to appear, with small tonnages pending in Illinois and nearby states.

Boston—Bids on the 5000-ton superstructure of the railroad lift bridge over Cape Cod canal, Buzzards Bay, Mass., have been indefinitely postponed due to delay in progress on the substructure. A larger number of small projects are active as PWA funds become available in New England.

New York—While the city of New York finally has been allotted more than $37,000,000 for PWA work, comparatively little additional steel will be required, as the money will largely be used for finishing work on subway lines. Other work provided for by this grant will take close to 10,000 tons in various projects.

Philadelphia — The outstanding award here in the week calls for 2300 tons for the Middletown, Pa., air port, placed with the Belmont Iron Works, Philadelphia, which also received 550 tons for an aviation base at Pearl Harbor, Hawaii. Except for the high-speed line work in Camden, N. J., bids on which are to be opened June 1, pending structural inquiry is light.

Shape Contracts Placed

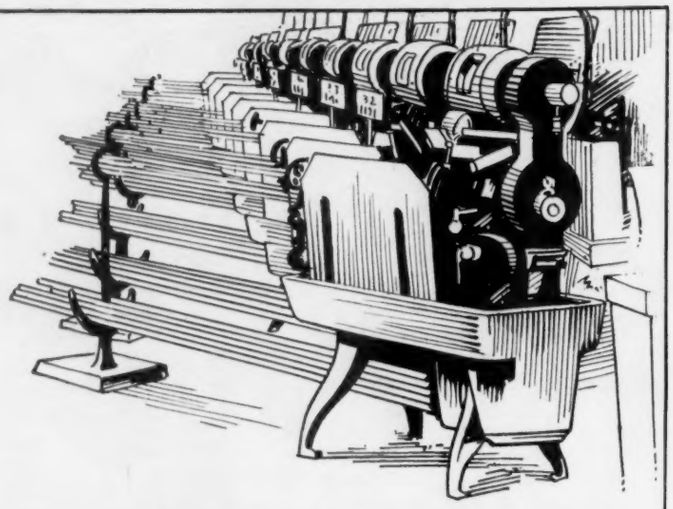
2200 tons, air depot, Middletown, Pa., to Belmont Iron Works, Philadelphia; Hughes Foulkrod Co., Philadelphia, general contractor.

1300 tons, Fifth Regiment armory, Baltimore, to McClintic-Marshall Corp., Bethlehem, Pa.; Wyatt & Nolting, Keyser building, Baltimore, architects.

Shape Awards Compared

	Tons
Week ended May 19	17,178
Week ended May 12	17,150
Week ended May 5	41,282
This week in 1933	3,090
Weekly average for 1933	15,413
Weekly average, 1934	17,516
Weekly average, April	12,333
Total to date, 1933	319,339
Total to date, 1934	367,838

Improved Improvements



All standard screw stocks have been improved in the last few years but HI-SULPHUR *is more than a "standard."* It is an "improvement over improvements." Moltrup is famous for specialties and Hi-Sulphur screw stock is a specialty—not a "run of the mine" product. » » Definite savings—through longer tool life—less idle machine time for tool grinding—better finish—greater speeds—smaller chips—more production. » » If automatics are ever equipped with speaking attachments let them have their own way—set them to say—

"Specify
MOLTRUP Hi-Sulphur Screw Stock"

THE TELEPHONE DIRECTORY IS AT YOUR ELBOW—CALL MOLTRUP NOW

Moltrup Steel Products Co.
Beaver Falls, Pa.
(Pittsburgh District)

New York • Chicago • Philadelphia • Cleveland • Boston • Houston • Detroit • Erie
San Francisco • Atlanta • Norfolk • Seattle • Pittsburgh • Buffalo • Dayton

1200 tons, bridge at Palmyra, N. Y., for New York Central railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

900 tons, state bridge, Ouachita river, Caldwell parish, Louisiana, to McClintic-Marshall Corp., Bethlehem, Pa.; List & Weatherly Construction Co., Kansas City, Mo., general contractor.

650 tons, state prison, Bordentown, N. J., reported placed through N. A. K. Bugbee, Trenton, N. J.

614 tons, state undercrossing at Pocatello, Idaho, to unnamed eastern interests; Northwest Roads Co., Portland, Oreg., general contractor.

600 tons, tunnel supports for metropolitan water district, Los Angeles, to McClintic-Marshall Co., Los Angeles.

550 tons, air fleet base, Pearl Harbor, Hawaii, to Belmont Iron Works, Philadelphia.

550 tons, bridge over southwest branch of Back river, Langley Field, Va., to McClintic-Marshall Corp., Bethlehem, Pa.; through Eastern Construction Co., New York.

550 tons, malthouse for Froedtert Grain & Malting Co., Milwaukee, to Worden-Allen Co., Milwaukee.

520 tons, planetarium, New York, to Lehigh Structural Steel Co., Allentown, Pa.; through White Construction Co.

510 tons, mill extension, Lead, S. D., for Homestake Mining Co., to Worden-Allen Co., Milwaukee.

450 tons, riding hall, Fort Meyer, Va., to Lehigh Structural Steel Co., Allentown, Pa.; Harwood-Nebel Co., Washington, general contractors.

444 tons, two bridges for Southern Pacific Co., at Gaviota, Calif., and Agua Caliente, Mex., to Columbia Steel Co., San Francisco.

440 tons, four state bridges, Arkansas, to Illinois Steel Bridge Co., Jacksonville, Ill.

390 tons, building for Kolb Baking Co., Richmond, Va., to Richmond Structural Steel Co., Richmond, Va.

370 tons, two 198-foot trusses, Franklin county, Ohio, to Pan-American Bridge Co., New Castle, Ind.

350 tons, privately-owned toll bridge, Lake Powell, Fla., for George D. Auchter Co., to McClintic-Marshall Corp., Bethlehem, Pa.

290 tons, drop section, El Fieste siphon, Mercedes, Tex., to unstated fabricator; Chamberlain & Strain, San Antonio, Tex., general contractor.

360 tons, laboratory, Rensselaer Polytechnical institute, Troy, N. Y., to Ingalls Iron Works Co., Birmingham, Ala.; through William L. Crow Co.

275 tons, bridges for Wabash railroad; 175 tons to American Bridge Co., Pittsburgh; 100 tons to McClintic-Marshall Corp., Bethlehem.

275 tons, bridge, project 4176, Crawford county, Arkansas, to J. B. Klein Iron Works, Oklahoma City, Okla.

240 tons, grade separation, Queens, for Triboro bridge, New York, to American Bridge Co., Pittsburgh; P. T. Cox Contracting Co., New York, general contractor.

230 tons, school, Buffalo, to McClintic-Marshall Corp., Bethlehem, Pa.

220 tons, bridges, Bowie and Harris counties, Texas, to Virginia Bridge & Iron Co., Roanoke, Va.

210 tons, bridge, Green-Coventry highway, Chenango county, New York, to Fort Pitt Bridge Works, Pittsburgh; through M. R. Ingraham Inc., Albany, N. Y.

210 tons, Industrial Arts building, Jamestown, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

200 tons, state highway bridge, Starks, Kane county, Ill., to American Bridge Co., Pittsburgh; through Worden-Allen Co., Milwaukee, general contractor.

190 tons, state bridge, Riverdale, Ill., to American Bridge Co., Pittsburgh.

185 tons, six beam spans, Marshall county, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

170 tons, building, Fulton, N. Y., to Empire Structural Sales Co., New York.

160 tons, bridge, Clovis, N. Mex., for Atchison, Topeka & Santa Fe railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

155 tons, bridge, project 769, Shelby county, Indiana, to Central States Bridge & Structural Co., Indianapolis.

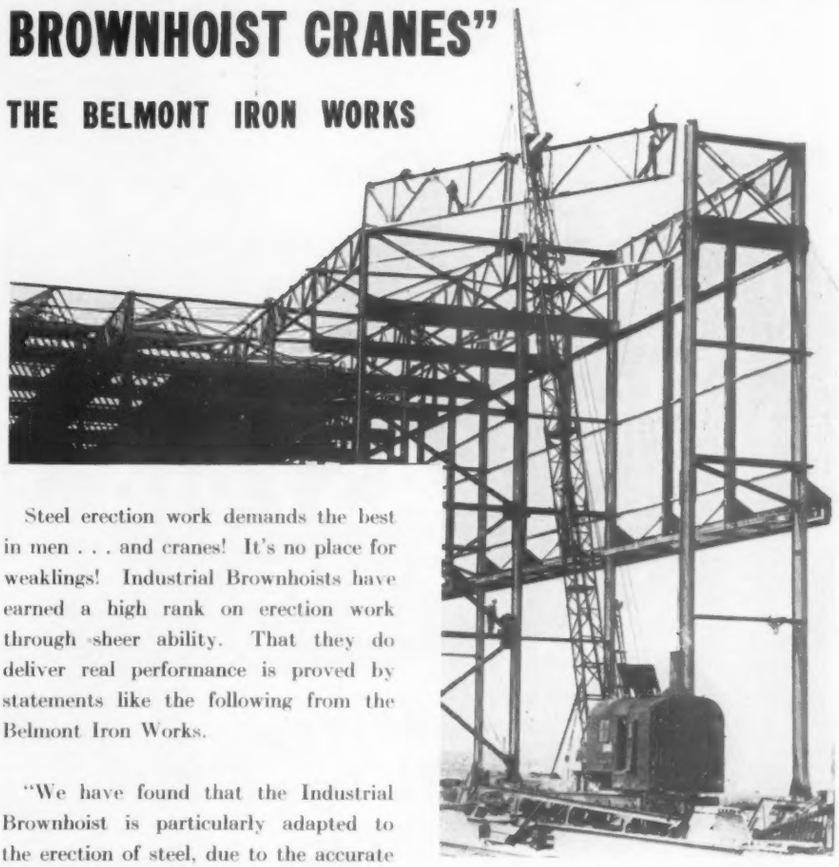
150 tons, state bridge, Round Rock, Tex., to Virginia Bridge & Iron Co., Roanoke, Va.

150 tons, railroad bridge, Concord-Davidson section, highway 74, North Carolina, to Southern Engineering Co., Charlotte, N. C., and Knoxville, Tenn.; Hobbs-Peabody Construction Co., Charlotte, general contractors.

145 tons, trusses, Oconee river bridge, Baldwin county, Georgia, to Nashville

"WE RECOMMEND INDUSTRIAL BROWNHOIST CRANES"

THE BELMONT IRON WORKS



Steel erection work demands the best in men . . . and cranes! It's no place for weaklings! Industrial Brownhoists have earned a high rank on erection work through sheer ability. That they do deliver real performance is proved by statements like the following from the Belmont Iron Works.

"We have found that the Industrial Brownhoist is particularly adapted to the erection of steel, due to the accurate control that the operator has of the load at all times. At the present time, we are using two Industrial Brownhoist locomotive cranes purchased in 1918 and 1920, and which are still in one hundred percent condition for our purposes.

"These machines have been extremely economical to operate and maintain, in view of the heavy service which we have given them. We have no hesitancy in recommending Industrial Brownhoist machines from our experience with them."

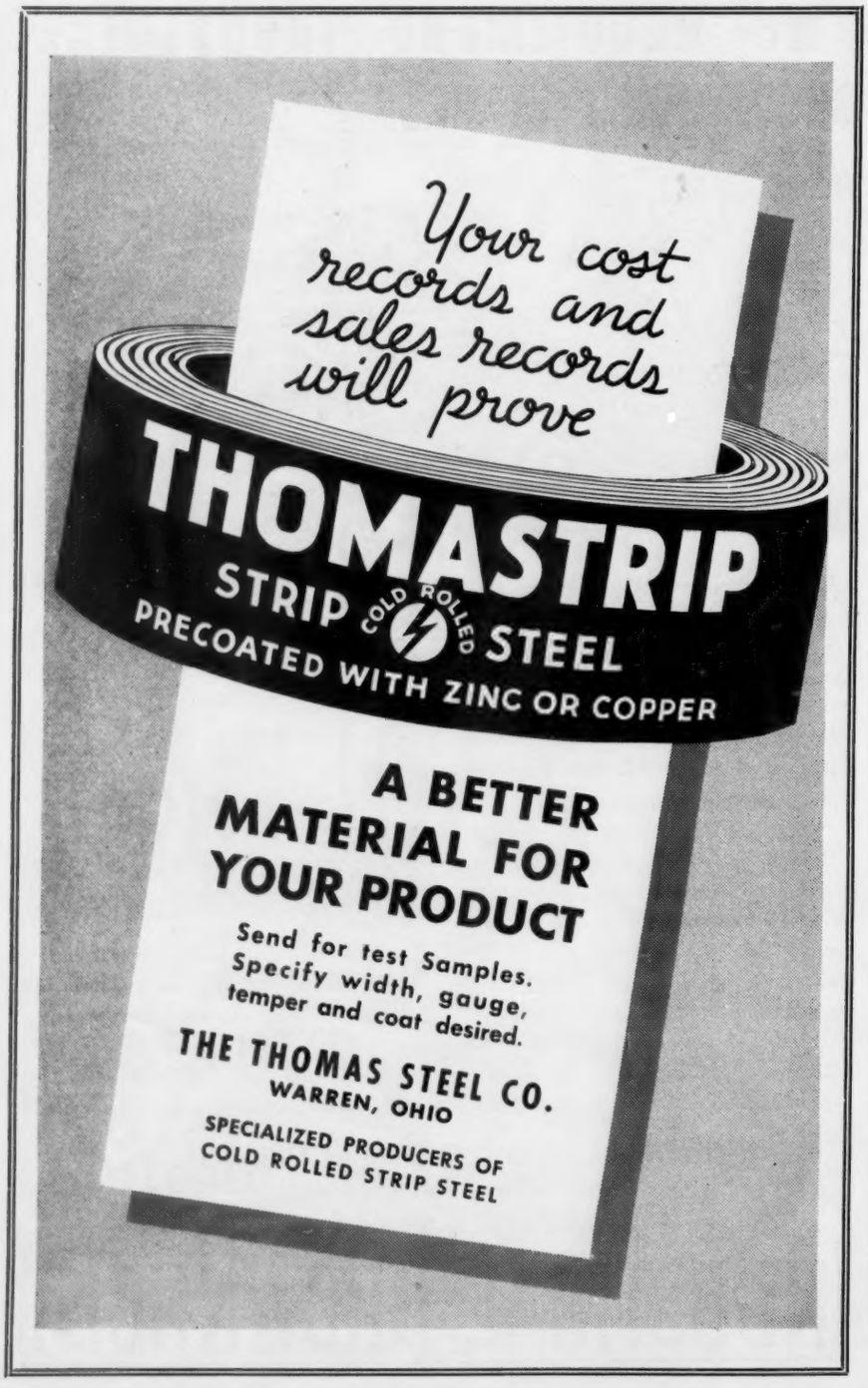
INDUSTRIAL BROWNHOIST CORPORATION

General Offices: Bay City, Michigan

District Offices: New York, Philadelphia, Chicago, Cleveland

INDUSTRIAL BROWNHOIST

Bridge Co., Nashville, Tenn.
145 tons, bridge No. 387-C, Lampasas county, Tex., to Fort Worth Iron Works, Fort Worth, Tex.; C. M. Davis, Fort Worth, general contractor.
125 tons, state span at Longview, Wash., to Steel Fabricators Inc., Seattle.
125 tons, highway bridges, Cross and St. Francis counties, Ark., to Arkansas Foundry Co., Little Rock, Ark.
110 tons, high school, Fort AuSable, New York, to Belmont Iron Works, Philadelphia; through T. C. Brown Co.
100 tons, piling, United States coast guard station, Frankfort, Mich., to Kalman Steel Corp., Bethlehem, Pa.
100 tons, state bridge, Panther creek, Daviess county, Kentucky, to Vincennes Bridge Co., Vincennes, Ind.
100 tons, bridge, Osceola, Mich., to R. C. Mahon Co., Detroit; 48 tons of concrete bars to Kalman Steel Corp., Bethlehem, Pa.
100 tons, shapes and bars, girder bridges, Sharp county, Arkansas, to Arkansas Foundry Co., Little Rock, Ark.; through Ault Rich Co., Cassville, Mo.
Unstated tonnage, postoffice, Auburn, Ind., to Pan-American Bridge Co., New Castle, Ind., and Truscon Steel Co., Youngstown, O.; James I. Barnes, Culver, Ind., general contractor.


Your cost records and sales records will prove
THOMASTRIP
STRIP COLD ROLLED STEEL
PRECOATED WITH ZINC OR COPPER
A BETTER MATERIAL FOR YOUR PRODUCT
Send for test Samples. Specify width, gauge, temper and coat desired.
THE THOMAS STEEL CO.
WARREN, OHIO
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

Shape Contracts Pending

5000 tons, superstructure, railroad lift bridge, Cape Cod canal, Buzzards Bay, Mass.; bids indefinitely postponed by United States engineer, Boston, due to delayed progress in substructure.
3400 tons, building Bellevue hospital, New York; funds approved, specifications out.
2450 tons, main spillway dam, Bonneville, Oreg., project; bids to United States engineer, Portland, Oreg., May 25.
3300 tons, contract No. 3, approach to subway, Camden, N. J., side of Philadelphia-Camden bridge; bids to Philadelphia-Camden bridge authority.
3000 tons, high school, Bay Side, Queens, N. Y.; funds approved, specifications out.
1000 tons, state highway bridges, Minnesota.
800 tons, tunnel ribs for metropolitan water district, Los Angeles; bids opened.
700 tons, glue factory for New England Chemical Industries, Woburn, Mass.
400 tons, freight sheds, Pennsylvania railroad, Thirtieth and Arch streets, Philadelphia; bids May 24.
350 tons, two schools, Jamestown, N. Y.; bids rejected by PWA, but may be revived after June.
300 tons, three bridges for Erie railroad; one at Allegheny, N. Y., 650 tons; one at Big Tree, N. Y., 250 tons; one at Dayton, N. Y., 100 tons; bids being taken.
159 tons, Ohio state bridge in Morrow village, Warren county, O.; bids to highway commission, Columbus, O., May 25. Also, 40 tons of concrete bars.
140 tons, state bridge over Yellow river at Milton, Fla.

Tin Plate

Tin Plate Prices, Page 56

Pittsburgh—A slight rebound in operations for the tin plate industry placed the average rate up 5 points last week to 75 per cent. Canners' specifications, however, have been diminishing. Prices of tin plate, tin mill black plate, and long ternes are unchanged.

New York—While domestic specifications for tin plate continue to decline, export buying prevails at a rate substantially in excess of that of recent years, considerably above 5,000,000 base boxes a year. This is attributed chiefly to foreign exchange, which, despite increases in the asking price in terms of dollars, has had the net effect of cheapening the cost of American tin plate for foreign buyers. The Orient continues to take the largest quantities.

Philadelphia—Tin plate specifications have fallen sharply, as a result of the unusually heavy specifications released early in the year. The Edgewood, Md., arsenal has posponed opening bids on a carload of tin plate from May 17 to May 24.

Reinforcing

Reinforcing Bar Prices, Page 57

Pittsburgh — Reinforcing steel prices are steady, at 2.05c, Pittsburgh, for cut lengths of new billet steel bars, and 1.90c for rail steel bars. Pennsylvania state highway lettings have subsided, but several projects in contractors' hands have yet to be closed.

Cleveland—Sales of reinforcing material are restricted to small lots, little public or private work developing. State work has been lacking so far this year because the federal government has not yet allotted Ohio its share of funds. The highway commission, however, has comprehensive plans prepared for projects requiring considerable tonnage for release when such funds are available.

Chicago—Lack of improvement in private building construction still is retarding activity in the reinforcing bar market. Small lots are being placed regularly for highway construction, while 1267 tons have been awarded for two sections of the Chicago sanitary district work. Inquiries are light but shipments against old orders are moderately heavier. The market continues 2.10c, Chicago, for cut lengths of billet bars, and 1.95c for rail steel.

Boston—Projects up for bids, both bridges and highways are heavier with some gain in building work. Awards, however, are light. The contracts for highway work out of Lexington, Mass., with a bridge in that town, will require close to 700 tons.

New York—Pending inquiry is smaller and awards are light. New Jersey is expected in the market soon for substantial tonnages for roads and bridges. Billet bars in cut lengths are 2.43c, delivered to the job in the New York district.

Philadelphia—With the Wallin Co. Inc. low for the general contract, 1300 tons of reinforcing bars for the head house at the Maiden Creek reservoir, Reading, Pa., probably will be placed in New York. Reinforcing bar awards are light.

Concrete Awards Compared

	Tons
Week ended May 19	7,291
Week ended May 12	3,318
Week ended May 5	7,149
This week in 1933	1,985
Weekly average for 1933	3,771
Weekly average, 1934	4,969
Weekly average, April	5,214
Total to date, 1933	66,946
Total to date, 1934	104,359

Reinforcing Steel Awards

2151 tons, state bridge, Coos Bay, Oreg., to Concrete Engineering Co., Chicago; Northwest Roads Co., Portland, Oreg., general contract.

1267 tons, sections 6 and 13, Chicago sanitary district, to Illinois Steel Co., Chicago; S. A. Healy, Detroit, general contractor.

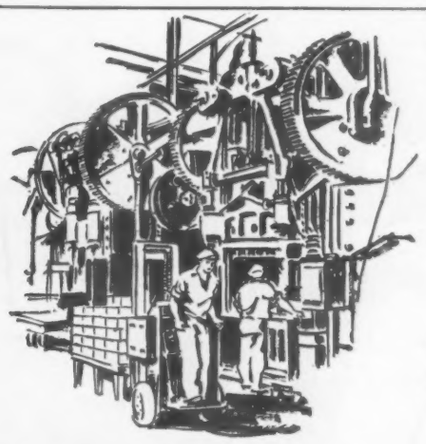
1000 tons, state bridge, Alsea, Oreg., to Mercer Steel Co., Portland, Oreg.; Lindstrom & Feigenson, Portland, general contractor.

450 tons, municipal negro hospital building, St. Louis, to Joseph T. Ryerson & Son Inc., Chicago.

359 tons, waterworks department, Minneapolis, to Concrete Steel Co., New York.

300 tons, school, Newark, N. Y., to Concrete Steel Co., New York; Royal-Rice Co., general contractor.

270 tons, bars and shapes, widening Eleventh street viaduct, Oklahoma City, including 200 tons of bars, to



"DIAMOND" STEEL PLATES FOR FACTORY FLOORING...

The ceaseless movement of materials—the rumbling of trucks—the tramp of an industrial army moves smoothly and safely over "A.W." DIAMOND STEEL FLOOR PLATES year in and year out. Wherever oil, grease or moisture makes footing unsafe or where wear is a vital factor, lay or *relay* this safe, sure, scientifically designed floor plate. It is safety "insurance"! Furnished also in ferrous or non ferrous metals.

SLIP-PROOF • OIL-PROOF
HEAT-PROOF • CRACK-PROOF
SAFE • SIGHTLY
SELF-DRAINING
SPLINTERLESS

ALAN WOOD STEEL CO. ESTABLISHED 1826 TRADE "A.W." MARK CONSHOHOCKEN, PA.

108 Years' Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

Branch Offices—Philadelphia—New York—Seattle
Los Angeles—San Francisco—Houston—Boston

Patterson Steel Co., Tulsa, Okla.; Earl W. Baker Construction Co., Oklahoma City, general contractor.

250 tons, Illinois state road work; 150 tons to Concrete Engineering Co., Chicago; 100 tons to Concrete Steel Co., Chicago.

235 tons, state undercrossing, Pocatello, Idaho, to unnamed eastern interests; Northwest Roads Co., Portland, Oreg., general contractor.

214 tons, state paving and undercrossing, Spokane county, Washington, to Northwest Steel Rolling Mills and Pacific Coast Steel Corp., Seattle.

200 tons, bridge over southwest branch of Back river, Langley Field, Va., to Capital Steel Co., Brooklyn, N. Y.; through Eastern Construction Co., New York.

200 tons, mill addition for Alber Bros. Milling Co., Oakland, Calif., to Pacific Coast Steel Corp., San Francisco.

150 tons, state bridge, Chester, Pa., through Carl R. Camp Inc., Philadelphia, to Taylor-Davis Inc., that city.

125 tons, riding hall, Fort Meyer, Va., to Rosslyn Steel & Cement Co., Rosslyn, Va.; Harwood, Nebel Co., Washington, general contractor.

120 tons, grade separation, Queens, N. Y., in connection with Triboro bridge, to Truscon Steel Co., Youngstown, O.; P. T. Cox Contracting Co., New York, general contractor.

Reinforcing Steel Pending

6000 tons, main spillway dam, Bonneville, Oreg., project; bids by United States engineer, Portland, Oreg., May 25.

1300 tons, head house, Maiden Creek reservoir, Reading, Pa.; Wallin Co. Inc., 103 Park avenue, New York, low for general contract.

275 tons, bridge and highway, Newburyport, Mass.; specifications out.

135 tons, hospital units, Waltham, Mass.; bids in.

100 tons, Gaudelupe creek bridge, Santa Clara county, California, for county; bids May 21.

100 tons, state highway work in Los Angeles county, California; bids May 31.

"Seminole" is the name by which experienced buyers designate the steel they insist on for hand and pneumatic chisels, punches, in fact for any tool which is used under shock conditions.

To be good, tools must be correctly designed and made from *good* steel. This usually means a steel especially developed for the purpose. "Seminole", a Ludlum Chrome Tungsten alloy combining strength and hardness with great toughness, is outstanding for all tools which must resist continuous or repeated shock.

At Ludlum you also have the services of experienced engineers and metallurgists who will assist you to get the utmost efficiency from "Seminole" or any other Ludlum tool or alloy steels.

There are also the famous Ludlum "Blue Sheets" containing data and reports on actual physical tests on various Ludlum tool steels, including "Seminole". These sheets are helpful—and free.

LUDLUM

LUDLUM STEEL COMPANY, WATERVLIET, NEW YORK

SILCROME · TOOL STEELS · NITRALLOY

Pipe

Pipe Prices, Page 57

Pittsburgh—Announcement of revised method of pricing of boiler tubes likely will be made next week, which will place prices on this grade of seamless tubing on a per foot basis with revised quantity extras. Led by orders for oil country goods, the pipe market still is active and pipe producers are seeking to ship completely on second-quarter balances before July 1. Ellicott Machine Corp., Baltimore, Md., is low on suction and discharge pipe and flap valves for the dredges at Fort Peck dam, Mont. Other bidders included Treadwell Engineering Co., Easton, Pa.; Crane Co., Chicago; Steacy-Schmidt Mfg. Co., York, Pa., and a partial bid from Michigan Valve & Foundry Co., Detroit.

Chicago—Placing of 189-mile pipe line involving 11,000 tons of steel, by the Great Lakes Pipe Line Co., Kansas City, Mo., marks the first large order of this type placed this year. Activity in this market otherwise is light, however, with no large inquiries pending. Cast iron pipe is slow and despite the large tonnage involved in pending work, orders are few.

Boston—Central Foundry Co. is low on about 400 tons of cast pipe for Kenne, N. H. New buying has slackened, but a fair volume of cast pipe remains to be specified. The New England pipe foundry is running double turns with a good backlog. Small lots of steel pipe are more active.

New York—Cast pipe awards are light, but include about 500 tons

for work at the Mount Morris hospital, N. Y. Most inquiries are for 200 or 300 tons each, generally state work with federal financial aid.

Birmingham, Ala.—Awards are not yet in sufficient volume to warrant speeding up production and pipe shops carry enough iron in yards to meet needs of the business in hand.

Cast Pipe Placed

2128 tons, 4 to 12-inch, class 150, Oakland, Calif., allocated as follows: 1094 tons to American Cast Iron Pipe Co., Birmingham, Ala., and 934 tons to United States Pipe & Foundry Co., Burlington, N. J.

500 tons, state hospital work, Mount Morris, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

483 tons, 24-inch, Chicago, to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 6 to 8-inch, class 150, Long Beach, Calif., to unnamed interest.

Steel Pipe Placed

11,000 tons, 189 miles, 8⅝-inch outside diameter, for Great Lakes Pipe Line Co., Kansas City, Mo., to A. O. Smith Corp., Milwaukee.

Cast Pipe Pending

410 tons, 6 and 10-inch, Keene, N. H.; Central Foundry Co., New York, low; bids May 14.

200 tons, government project, Fort Peck, Mont.; bids opened at Kansas City, Mo., May 10.

166 tons, twelfth naval district, San Francisco, schedule 3074; bids opened.

131 tons, various sizes, including 24 tons of fittings, Milwaukee; bids May 24.

125 tons, 6-inch, Southern Pines, N. C.; Boyd & Goforth, Charlotte, N. C., low on contract for furnishing and laying.

100 tons, 3 to 6-inch, Farmingdale, N. Y.

Pig Iron

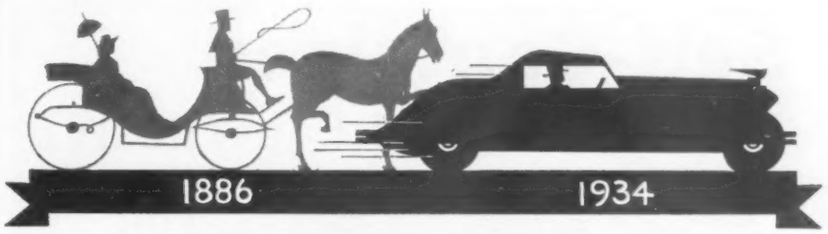
Pig Iron Prices, Page 58

Pittsburgh — Both foundry and basic iron shipments hold at a high rate in this district although there has been practically no test of the advanced market, which is quoted on the local base $18.50 for foundry grades, $18 on basic and $19 on bessemer. Good backlogs permit operation of both Davison Coke & Iron Co.'s and Sharpsville Furnace Co.'s merchant furnaces in this district, for at least another six weeks.

Cleveland—Indications are that pig iron producers will open books for third quarter June 1, without any further advances. Under the 10 day notice clause in the steel code new prices to apply June 1 would have to be filed May 21. No such action was contemplated late last week. However, the advance of $1 a ton named in April on all second quarter tonnage not under contract at the former prices will become generally applicable for third quarter. Few sales have been made at the higher prices. Consumers specify liberally on their second quarter contracts.

Boston—Shipments are limited to one or two cars at a time. The stock of foreign iron at Providence, R. I., is frequently moved by truck and the Troy, N. Y., furnace, now in blast, is competitive in the western part of New England.

Chicago—Foundry operations are spotty but pig iron shipments continue to improve gradually and currently are in the best volume so far this year. Small decreases in the foundry melt are noted in some instances, but production of railroad products is increasing while sched-



FROM WAGON WHEELS TO *Streamlined* MOTOR BODIES

In 1886 Elihu Thomson invented the Thomson Process, the art of joining metals by electrical resistance. Since then, the company which he founded has continued to lead in the development and application of the Thomson Process

In the heyday of the horse and carriage, Thomson Process resistance welders were an important part of the equipment of plants making metal parts and hardware for wagons and carriages.

Today, in modern automobile plants, bigger, better Thomson-Gibb machines help keep the sleek, new models rolling off the assembly line.

This same development has occurred in every industry where metals must be joined. Thomson-Gibb has built welding equipment to join them better, faster and cheaper.

How about your product? Would new Thomson-Gibb equipment reduce the welding cost or step up the production? A check-up will cost you nothing. Simply fill in the coupon below and mail it attached to your letterhead.

THOMSON-GIBB ELECTRIC WELDING CO.

Thomson-Gibb Electric Welding Company
163 Pleasant Street, Lynn, Mass.

Gentlemen:

☐ Please ask your nearest engineer to arrange for an appointment at our plant.
☐ Please *mail* information on the welding of

Product..... Metal.....

Approximate dimensions.....

Desired production per hour..... 6048

ules of automotive foundries are fairly steady. Substantial iron tonnages remain to be delivered and assure a continuation of a fairly heavy movement during the remainder of the quarter. New business at $18.50, furnace, for No. 2 foundry and malleable is light.

New York—Contract shipments of pig iron are picking up slowly, with further improvement indicated, particularly in June, when contracts expire. With virtually all consumers covered by contract, there is little new buying.

Philadelphia—With pig iron releases continuing light, sellers look for substantial tonnage to come out in June, as the period covered by contracts comes to a close.

Buffalo—Sales of pig iron are comparatively quiet. No contracts of any size are pending.

Cincinnati — Shipments continue unabated, with possibility of an improvement next month to get out all tonnage under second quarter contract. Stove foundries are on a heavy seasonal run with tendency for a lighter melt in jobbing foundries.

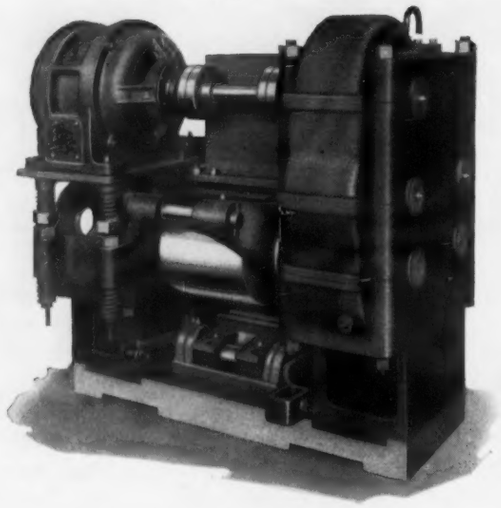
St. Louis—Shipments have increased slightly. Foundry schedules are not likely to be affected by seasonal restrictions before the second week in June.

Birmingham, Ala. — Shipments against contracts are slower, although ten blast furnaces continue in operation, four on foundry, five on basic and one on special brand iron. Surplus stock of iron will show some addition at end of month.

Toronto, Ont.—Demand for pig iron, while sustained, is confined to small tonnage lots. Daily melt is unchanged, but improvement is anticipated, largely depending on new business from railways. Prices are firm and unchanged.

Self-Contained—

but not self-destructive



ERIE BOARD DROP HAMMERS

Type M Motor Driven Head

No ERIE board drop has ever broken the feet off the motor, broken the motor frame, burned up due to chafed insulation, or had a bit of motor trouble of any sort. The reason lies in the motor mounting illustrated above, with the weight of the motor, and the rebound, both cushioned on springs, and with the drive through two pairs of flexible couplings and a wobbler shaft.

Say goodbye to trouble when you install a Type "M" ERIE. You are not taking on new troubles in exchange for your old, not trading belt expense for motor failures.

ERIE FOUNDRY COMPANY

ERIE, PENNA., U. S. A.

Detroit 335 *Curtis Bldg.* — *Chicago* 549 *Washington Blvd.* — *Indianapolis* 335 *Postal Station Bldg.* — *Paris, France* 8 *Rue de Rocroy*

ERIE

Scrap

Scrap Prices, Page 59

Pittsburgh—No. 1 heavy melting steel at Pittsburgh declined another 25 cents a ton last week to $12.50 to $13. Even at this figure, scrap is nominal in view of inability of dealers and brokers to sell. No early break is looked for in face of a decline in melting operations, expected to set in shortly and steady offerings of dealer, industrial and railroad scrap material. With conditions definitely making scrap in a buyers' market, small distress tonnages are being taken in by melters at considerable reductions. As example, three cars of distress scrap rails were sold at $11.50 to a district mill last week.

Cleveland—Mills seem well supplied with steel scrap and are out of the market. Shipments are being restricted in some instances. Three cargoes by lake have been received in the past few days. Prices are weak but unchanged.

Chicago—Scrap prices continue to drop in the absence of mill buying. Heavy melting steel has been offered to consumers at $11 and with dealers buying this material at $10.75, the market is off 25 to 50 cents a ton. Prospects for new buying are regarded as favorable in view of sustained steelmaking operations, although some mills are attempting to reduce inventories.

Boston — Scrap prices continue weak and buying is sluggish. Heavy melting steel is 25 cents a ton lower. The Worcester, Mass., consumer has lowered its delivered prices. Heavy cast, forge flashings and forge fire scrap, railroad malleable, scrap rails,

skeleton and yards steel are all weaker. Shipments have slackened.

New York—Heavy melting steel grades for barge loading are off 50 cents per ton further, with lower prices quoted by dealers on numerous grades, including No. 1 heavy and heavy breakable cast, car wheels, rails for rolling, skeleton steel and wrought grades. No. 1 machinery cast for local foundry delivery as well as No. 2 are also weaker.

Philadelphia—Scrap prices generally have declined further, dropping 25 to 50 cents a ton. No. 1 heavy melting steel is now $11, delivered, eastern Pennsylvania, and No. 2 steel, $8.50 to $9. The leading Coatesville, Pa., consumer of heavy melting steel has recently purchased a modest tonnage at $11, following the acquisition of a tonnage earlier in the month at $11.50. Weakness is attributable chiefly to light buying, with prospects for little improvement.

Buffalo—Scrap trading is dull and mills are holding back shipments. The market is normal in absence of buying.

Detroit—Tonnage in scrap lists here last week lightened some of the market pressure, though prices still reflect inherent weakness. Loose sheet clippings are off 25 cents to $5.25 to $5.75.

Cincinnati—Dealers have reduced buying prices on iron and steel scrap again. Heavy melting steel is off 50 cents and other grades in harmony. Mills are taking shipments against contracts but embargoes have been placed on some foundry business.

St. Louis—The downward trend in iron and steel scrap prices continues. Purchasing is confined to a few scattering carloads of miscellaneous material. Steelmakers are well provided for on all immediate requirements.

Birmingham, Ala.—Scrap iron and steel continues sluggish. Small lot shipments rule. Prices are weak.

Toronto, Ont.—Trading in iron and steel scrap is dull. While there is practically no demand for steel scrap for domestic consumption, it is stated that Montreal dealers are accumulating orders for export to Britain with the opening of St. Lawrence navigation. Current demand is for iron grades. Prices are unchanged.

Nonferrous Metals

Nonferrous Metal Prices, Page 58, 59

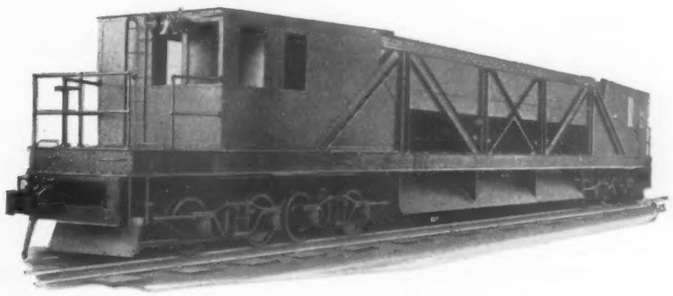
New York—Copper and zinc held steady but easiness developed in lead, tin and antimony last week.

Copper—Domestic sales of blue eagle copper totaled more than 4000 tons compared with around 1000 tons in the preceding period. Bulk of the buying was done the first three days, however. Price steadiness continued with electrolytic at 8.50c, Connecticut, and prime lake metal at 8.62½c, Midwest. Predictions in the trade were to the effect that the next movement in prices would be upward rather than the opposite. Continued progress in clarification of the code was reported. H. O. King has been replaced by W. A. Janssen as code administrator.

Zinc—Competitive business was exceedingly quiet but no price weakness developed despite the appearance of bids at $5.30c on prime western or $1 a ton under the going market.

Lead—American Smelting & Refining Co. announced a reduction of $2 a ton Thursday which was quickly followed by other producers. On the following day a further cut of

ATLAS ORE TRANSFERS



100 ton—3 compartment Ore Transfer. Roller Bearing Journals. Double end control for car operation. Individually operated discharge gates.

OTHER ATLAS PRODUCTS

Gas-Electric and Diesel-Electric Locomotives . . . Electric Transfer Cars for Blast Furnaces and Steel Plants . . . Stockhouse Scale Cars for Blast Furnaces . . . Concentrate and Calcine Cars for Copper Refineries . . . Automatic and Remote Controlled Electric Cars . . . Pushers, Levellers and Door Extractors . . . Coal Charging Lorries, Coke Guides and Clay Carriers . . . Atlas Patented Coke Quenching Cars for By-Product Coke Ovens . . . Atlas Patented Indicating and Recording Scales . . . Special Cars and Electrically Operated Cars for every conceivable Purpose

THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

$3 was announced. This brought the St. Louis figure down to 3.85c and the New York level at 4.00c. Brisk buying developed following the second decline with smelters easily balancing ore intake.

Antimony—Prices were easy with only occasional spot lots reported sold. Spot was quoted 8.50c.

Tin—Straits metal dropped to 53.00c early in the week but later recovered to 53.70c only to drop to 53.15c on Friday. Trading was quiet. Ford Motor Co. was reported in the market Friday for Banka tin.

Silver—A bill probably will be presented in Congress this week placing silver on a 25 to 75 ratio with gold. A tax of 50 per cent is proposed on speculative silver.

Cold Finished

Cold Finished Prices, Page 57

Pittsburgh—The cold-finished steel bar market is steady at 2.10c base, Pittsburgh, with an advance of $3 per ton expected in June. Alloy cold-drawn bars are steady and unchanged at 3.05c base, Pittsburgh. Cold-finished steel bar shipments still decline and incoming specifications reflect the same trend.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 57

Little change is noted in demand for bolts, nuts and rivets. Railroad and carbuilding needs are expected to aid in keeping up volume of orders. Pittsburgh suppliers last week received somewhat larger orders and the decline in specifications was arrested.

Railroad equipment builders in the Chicago district have sufficient orders on books to indicate large requirements the next few months. Farm implement builders are buying steadily.

Releases from automobile manufacturers to nut and bolt makers at Cleveland are diminishing. Demand from railroad equipment builders is steady, while improvement is noted in shipments to northwestern jobbers.

Bolts and nuts are not entirely steady at 70 off, small rivets are 70 and 5 off, structural rivets 3.00c, Pittsburgh, and 3.10c, Chicago, and wrought washers 6.25 off.

Iron Ore

Iron Ore Prices, Page 58

Cleveland—A few sales of iron ore have been made in the open market at last year's prices, and it is believed these values will be applied on long-term contracts. Vessel rates on iron ore have not been determined finally, but it is understood there will be no increase. An advance of 5 cents a ton on the coal carrying rate is being considered. The Lake Superior Iron Ore association reports on ore consumption and stacks:

	Tons
Consumed in March	2,189,566
Consumed in April	2,470,121
Increase in April	280,555
Consumed in April, 1933	771,972
On hand at furnaces, May 1, 1934	22,009,996
On Lake Erie docks, May 1, 1934	4,570,626
Total at furnaces and Lake Erie docks, May 1, 1934	26,580,622
Total May 1, 1933	28,847,977

Philadelphia—Approximately 6000 tons of Algerian low phosphorus iron ore arrived here recently for the account of an eastern Pennsylvania consumer.

Ferroalloys

Ferroalloy Prices, Page 58

Ferromanganese specifications are smaller, although sellers see increased activity in June. Meanwhile prices are steady at $85, duty paid, eastern seaboard. Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $26, furnace, for spot tonnage, with contracts at the usual differentials.

Metallurgical Coke

Coke Prices, Page 57

With full application of the 35-cent per ton emergency surcharge, the market on standard furnace coke is quoted $3.60 for yearly contracts, Connellsville oven basis, and for spot shipments $3.85. Previously there had been some understanding that yearly contracts for beehive coke were exempt from the 35-cent per ton extra charge. Foundry coke prices hold unchanged at $4.60 for common grades and $5.35 for premium brands. The market is exceptionally quiet with little new buying.

Shipments of by-product foundry coke at Chicago recently have been at the best rate of the year. The

STRIP STEEL
HOT and COLD ROLLED

in regular carbon Steel of any analysis including alloy steels

also
STAINLESS METALS
in
CHROME and CHROME NICKEL
analyses

SUPERIOR STEEL CORPORATION

General Office
3122 Grant Building
Pittsburgh, Pa.

Works at
Carnegie, Penna.

SALES OFFICES

2002 Girard Trust Bldg.
Philadelphia, Pa.

1017 Fisher Bldg.
Detroit, Mich.

Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.

H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

market holds at $8.50, ovens, for outside shipment and $9.25, delivered, Chicago. Shipments of by-product foundry coke at Cincinnati are slightly greater than the April rate. Buying at St. Louis is limited but shipments are at a high rate. Shipments by Birmingham, Ala., producers have declined.

Coke By-Products

Coke By-Product Prices, Page 57

New York—Demand for distillates, especially toluol and xylol, are active, with supplies light. Prices are firm and unchanged. Shipments of sulphate of ammonia are smaller than expected, at unchanged prices.

Quicksilver

New York—Quicksilver prices are easy in a dull market. Round lots are available at $75, a virgin flask of 76 pounds and small lots at $75.50, with some sellers holding to $76.

New Prices Filed With Institute

LOWEST base prices for the products mentioned, and effective dates, filed with the American Iron and Steel institute, New York, last week include:

Effective May 21

Stapling wire in 8-inch coils, 4.65c, Pacific coast ports.
Tag wire, 4.65c, Pacific coast ports.
Unassorted ingot iron long ternes, No. 24 gage, 4.65c, Pacific coast ports.

Effective May 22

Mill run cold finished sheets, No. 20 gage, 3.05c, Pittsburgh.
Drawn wire and special wire products, at Chicago and Seattle, 3.15c to 5.75c
Florists wire (per 12-pound box) 67c, Chicago.

Effective May 24

Special analysis die block steel, 51c, Buffalo and Pittsburgh.
Electrical sheets coiled, various grades, 3.70c to 8.35c, Pacific coast ports.
Hair pin wire, 4.60c, Pittsburgh.
Grape tie wire, 4c, Pittsburgh, and 4.05c, Chicago.
Weaving wire (not for fly screen cloth), 4c, Pittsburgh.

Effective May 25

Cold-rolled strip, domestic piston ring tempered, 0.81/1.00 carbon, 3c, Worcester, Mass.
Tempered belt knife steel, 19.50c, Worcester, Mass.
Sash balance steel (black tempered), 0.81/1.00 carbon, 3c, Worcester, Mass.
Doctor blade steel, 0.80/1.00 carbon, 16c, Worcester, Mass.
Pen steel, 0.80/1.25 carbon, 16.65c, Worcester, Mass.

Effective June 1

Tool steel, class 1, billets, 49½c, Bethlehem, Pa.
Tool steel, class 1A, bars, 65c; billets, 58½c, both at Bethlehem, Pa.
Tool steel, class 1D, bars, 2c; billets, 1.80c, both at Bethlehem, Pa.
Tool steel, class 1E, bars, 55c, Syracuse, N. Y., and Bethlehem, Pa.; billets, 49½c, Bethlehem, Pa., and Syracuse, N. Y.
Tool steel, class 2, bars, 47c, Syracuse, N. Y.; billets, 42.3c, Bethlehem, Pa., and Syracuse, N. Y.
Tool steel, class 2A, bars, 42c, Syracuse, N. Y.; billets, 38.8c, Bethlehem, Pa., and Syracuse, N. Y.

Effective May 26

Cold-rolled strip steel lamp stock (oiled), 3.60c, Pittsburgh.
Long ternes (steel), No. 24 gage, 3.65c, Pittsburgh.

Production

(*Continued from Page* 12)

operating against 58 a week ago. Republic Steel Corp. banked a blast furnace at Lansingville.

Pittsburgh—Unchanged at 51 per cent last week, with no change expected for this week. Twenty-seven out of 60 steelworks stacks continue active and individual rates are as follows: Carnegie Steel Co., 10 of 32, Jones & Laughlin Steel Corp., 7 of 11, Bethlehem Steel Co., 5 of 7, National Tube Co., 2 of 4, and 1 of 2 each for American Steel & Wire Co., Pittsburgh Steel Co., and Pittsburgh Crucible Steel Co.

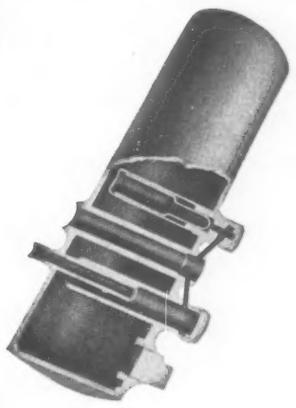
Cleveland-Lorain—Steelworks operations averaged 78 per cent last week, up 1 point from the week preceding. Corrigan, McKinney Steel Co. continued with 12 open hearths, Otis Steel Co. with 7, while National Tube Co., at Lorain, O., is alternating between 11 and 12. No change in the rate is scheduled for this week.

Chicago—Off only fractionally to 64 per cent, despite a decrease in schedule by one large interest. Indications point to some slackening during the rest of the quarter, although changes are expected to be slight prior to July.

Buffalo—Continued at 66 per cent last week, with the rate expected to drop 16 points to 50 per cent starting this week. Nineteen open hearths were in production last week. Curtailment of shipping instructions from

One of 30,000
STAMPINGS

Produced by
CROSBY
Stamping Engineers



Since 1896 the Crosby plant has been devoted, exclusively, to designing and producing Sheet Metal Stampings. Avail yourself of this experience. Send us your next stamping problem and watch results.

Manufacturers IDEAL TROLLEY WHEELS

THE CROSBY COMPANY
BUFFALO, N. Y.

Branch Offices: New York, Philadelphia, Pittsburgh, Cleveland, Detroit, Chicago.

automotive buyers is responsible for reduced output.

Detroit—At 100 per cent, steel ingot operations held unchanged last week from the week prior. All 17 of the district's open-hearth furnaces are in operation, as are all four of the blast furnaces located here.

Central eastern seaboard — Unchanged for the second consecutive week at approximately 45 per cent. An increase is likely before the close of this month, with a further gain expected in June.

Wheeling—Dropped 5 points last week to 74 per cent, with 29 out of 39 open-hearth furnaces in the district active.

Birmingham — With 13 open hearths producing ingots, the rate advanced 1½ points last week to 53½ per cent, the increase being due to the fact that some steel was being piled up to meet emergencies.

New England—Up 4 points to 84 per cent last week, one steelworks going to full capacity. A further gain is expected this week when a second works is expected to put on all open-hearth furnaces.

¶American Institute of Steel Construction Inc., New York, reports April bookings and shipments of fabricated structural steel were the largest for any month in 1934. Reports from 66 per cent of the industry show bookings 20 per cent and shipments 11 per cent over any other month this year. April bookings were 125 per cent larger than for April, 1933, and backlogs are about 50 per cent greater than for the corresponding month last year.

Here and There In Industry

SALE of properties of the Heine Boiler Co., St. Louis, to foreclose mortgages securing a $350,000 bond issue has been ordered by the federal court on application of the St. Louis Union Trust Co., trustee for the bonds. The Heine company, one of the oldest of its kind in the midwest, in receivership since 1929, issued bonds for $750,000 in 1923, and $400,000 was retired. The remainder is in default. It is expected the properties will be bought in by the bondholderss' committee, and that the company will be reorganized.

□ □ □

Henry Disston & Sons, Philadelphia, will soon move their Detroit office from 620 East Hancock street to 2843 East Grand boulevard.

□ □ □

Moltrup Steel Products Co., Beaver Falls, Pa., has moved its New York office to the Canadian Pacific building, 342 Madison avenue. J. J. Callahan is district manager.

□ □ □

American Steel & Wire Co., Cleveland, has been named national distributor by A. O. Smith Corp., Milwaukee, for a new type of metal laced road joints recently introduced by the latter.

□ □ □

Allis-Chalmers Mfg. Co., Milwaukee, has booked an order from the government for nearly $300,000 worth of track-type tractors and road graders for forestry work and the army ordnance department.

□ □ □

Harmer Steel Products & Supply Co. is the new name adopted by Harmer Railway Supply Co., Portland, Oreg. The company has moved to its new warehouse and offices at 120 West Front avenue.

□ □ □

Chain Belt Co., Milwaukee, has placed a stock of its malleable and steel chains, roller chain, sprockets, set collars, pillow blocks and take-ups in its warehouse at Detroit. The office has been moved to 5169 Martin avenue, adjacent to the warehouse. It is in charge of C. E. Martin.

□ □ □

Eighth international petroleum exposition at Tulsa, Okla., May 12 to 19 had more than 500 exhibitors of machinery, tools, pipe and other products. Included were Republic Steel Corp., Youngstown, O.; Jones & Laughlin Steel Corp., Pittsburgh; Youngstown Sheet & Tube Co., Youngstown, O.

□ □ □

E. I. Du Pont de Nemours & Co. Inc., Wilmington, Del., has placed an order with A. O. Smith Corp., Milwaukee, for 15 layer-constructed pressure vessels for storing hydrogen used in chemical processes. They are of laminated steel plate, 22 feet long and 24 inches inside diameter. This is the first order of the kind to this maker since 1929.

□ □ □

Harnischfeger Corp., 4411 West National avenue, Milwaukee, has developed and is producing a new type of portable electric generating plant for use by utilities as a standby power source. One of the first units has been delivered to a public utility at Washington. The unit is being built and sold by a new division of electric motors and generators, with R. J. Wadd sales manager.

□ □ □

William H. Ziegler Co. Inc., 2331 University avenue Southeast, Minneapolis, representing the Caterpillar Tractor Co., Athey Truss Wheel Co., Fate-Root-Heath Co., Nordberg Mfg. Co., La Plant-Choate Co., Archer Iron Works, Barber-Greene Co., Bates Valve Bag Co., Heltzel Steel Form & Iron Co., A. Leschen & Sons Rope Co., Littleford Brothers, Sterling Wheelbarrow Co. and others, will open a branch office and warehouse

RAYMOND

Springs

For fifty years Raymond has been producing high quality springs, wire forms and stampings—

A modern up to date plant—the use of high grade materials and careful heat treatment *plus* Raymond experience should be able to—and can—end your spring troubles.

Let us help you with the proper spring design—and let us quote you on your requirements.

Raymond Mfg. Co.
Corry, Pa.

at Glasgow, Mont. A. V. Duncanson, sales engineer for the company for the past twelve years, has been appointed manager.

□ □ □

Davis Engineering Corp., Elizabeth, N. J., is low on 12 heat exchangers, approximately 11½ feet in length for the Fort Peck, Mont., dam dredges, bidding $5408.52, or on a steel spiral welded pipe alternate $5194.68. Other bidders, of which there were 14 included: Treadwell Construction Co., Midland, Pa.; Struthers-Wells-Titusville Corp., Warren, Pa.; Henry Vogt Machine Co., Louisville, Ky.; J. P. Devine Mfg. Co. Inc., Mt. Vernon, Ill.; Elgin Softener Corp., Elgin, Ill.; and Condenser Service & Engineering Co., Hoboken, N. J.

□ □ □

Buckeye Jack Mfg. Inc., Alliance, O., has bought all the physical assets of Buckeye Jack Mfg. Co., recently in receivership, manufacturer of automotive and railroad jacks. A new type of jack is being developed for announcement soon. Directors of the new company are: A. L. Atkinson, president of Alliance First National Bank; A. A. Mulac, president of Buckeye Twist Drill Co.; Alex Robertson, works manager American Steel Foundries, and H. E. Blasingham. The latter has been made president and general manager. D. C. Vick is director of sales. A sales office will be maintained in Detroit under the direction of George W. Wiard and an export office will be located at 280 Broadway, New York, in charge of E. W. Lenz. F. L. Pearson is secretary and treasurer.

□ □ □

Homestead Valve Mfg. Co., Coraopolis, Pa., has appointed as exclusive representatives for its valves, Grinnell Co., 240 North Highland avenue, Atlanta, Ga.; L. E. Livingston, 2012 Ward parkway, Fort Worth, Tex.; National Supply Co., Toledo, O. It also has appointed the following representatives for sale of its hypressure jenny: For the Indianapolis district, South Side Body Co. Inc., 109 West Morris street, Indianapolis; for northern Texas, L. E. Livingston, 2012 Ward Parkway, Fort Worth, Tex.; for Minnesota, North and South Dakota, William H. Ziegler Co., 2331 University avenue, S. E., Minneapolis; for Philadelphia area, Brogan & Company, 810 Race street, Philadelphia; for Pittsburgh and tri-state area, Beckwith Machinery Co., 6550 Hamilton avenue, Pittsburgh; for southeastern Texas, James A. Hall, 110 Byrne street, Houston, Tex.; for Wisconsin, Boehck Equipment Co., 2404 West Claybourn street, Milwaukee.

Equipment

Chicago—Plant equipment demand still is increasing, with a greater improvement noted in certain types recently. Machine tool orders, while generally confined to small lists, have been in the best volume so far this year during the past few weeks and May is expected to be the best month to date in 1934. Railroads continue to purchase but few tools, but, indicative of better operations at shops, are more active in buying machinery repair parts. This also is true of railroad equipment builders. Shaw-Box Crane & Hoist Co. has been awarded contract for a 10-ton bridge crane for the arsenal at Fort Lewis, Wash. For the same point Lodge & Shipley Machine Tool Co. booked a tool room lathe; bids April 17.

Pittsburgh—Last week Rotary Electric Steel Co., Detroit, placed an order for a cold strip mill with E. W. Bliss Co., Salem, O. The new mill will roll up to 12 inches in width and will have a capacity of about 2000 tons monthly. Completion is expected by August. Although Youngstown Sheet & Tube Co. still reports it has not made definite award of the new strip-sheet mill at Struthers, O., reports persist in Pittsburgh equipment circles that contract for the new rolling mill has been awarded to a leading Pittsburgh interest and although this is not confirmed, it is fairly certain that the award at least has been promised.

Boston—Machinery and equipment business is slightly more active in New England. Washburn Wire Co., Phillipsdale, R. I., has purchased a bar mill and a finishing mill from a mid-west steelworks, materially increasing its finishing operations. Morgan Construction Co., Worcester, Mass., is installing a precision stand on a bar mill for production of round rods within close tolerances for the Bethlehem Steel Co.

New York—While rejections have been numerous on the sizable list for the Frankford, Pa., arsenal some awards have been made, including band turning machine to Gisholt Machine Co., Madison, Wis.; hand screw

MICHIGAN SEAMLESS TUBE COMPANY
SOUTH LYON, MICH.
MICHIGAN
COLD DRAWN SEAMLESS
STEEL TUBING
Manufacturers of cold drawn seamless steel tubing in any form and to any carbon or alloy specification in sizes from 3″ outside diameter down to 1/16″ and in wall thickness from 5/8″ to 26 gauge.
ROUNDS • SQUARES
HEXAGONS • SPECIAL SHAPES
MICHIGAN • • • •
SEAMLESS TUBE COMPANY
A Michigan Corporation
Mills and General Offices: South Lyon, Michigan
(Suburb of Detroit)
Sales Representatives:
Chicago . Cincinnati . Cleveland . Detroit . Indianapolis
Memphis . New York . St. Louis . Washington, D. C. . Los Angeles

machine, Warner & Swasey Co., Cleveland; two hydraulic surface grinders, VanDyck-Churchill Co.; one 16-inch shaper, A. Lynch Machinery Co., Philadelphia. Cleveland Automatic Machine Co. is low on three automatic screw machines. Landis Machine Co., Waynesboro, Pa., booked a bolt threading machine for the navy. Outside of government inquiry, demand for machinery is dull although considerable private industrial business has been figured which is slow to develop.

Pacific Coast

Pacific Coast Prices, Page 57, 58, 60

San Francisco—(*By Air Mail*)—Demand for steel products is improving and bookings of cast iron pipe and structural shapes last week were the highest this year.

Pacific Coast Steel Corp. took 200 tons of reinforcing bars for an addition for Alber Bros. Milling Co., Oakland, Calif., and 147 tons for Boulder dam, Boulder City, Nev. Bids will be called for about July 1 for 1000 tons each of bars, plates and shapes for the Parker dam on the Colorado river in Colorado. Pending business now exceeds 25,000 tons.

Plate bookings included 2500 tons for tunnel lining for the Metropolitan water district, Los Angeles, booked by Commercial Shearing & Stamping Co., Los Angeles. Southern Pipe & Casing Co., Los Angeles, took 290 tons for 22-inch pipe for the metropolitan water district, Los Angeles. Among new inquiries is one for 1500 tons for a 20 to 30-inch welded steel pipe line for the east bay municipal utility district, Oakland, Calif.

McClintic-Marshall Corp. booked 600 tons of shapes for tunnel supports for the metropolitan water district, Los Angeles; and Columbia Steel Co., 444 tons for two bridges for the Southern Pacific Co. Bids have been opened on 800 tons for tunnel ribs for a Los Angeles public project.

Oakland, Calif., awarded 1094 tons of cast iron pipe to the American Cast Iron Pipe Co. and 934 tons to the United States Pipe & Foundry Co. Bids have been opened on 645 tons for Ordway, Colo., and on 200 tons for Fort Peck, Mont.

Hydroelectric Work Leads

Seattle—United States engineer at Portland, Oreg., has called bids for May 25 for construction of the main spillway, Bonneville dam project, requiring 6000 tons of reinforcing and 2450 tons of structural shapes.

Specifications have been completed and bids have been set for June 21 for the Bonneville powerhouse, covering the two initial power units of the ultimate ten or 12 in the $31,000,000 project. Plans call for turbines for 60,000 horsepower with effective head at 50 feet and 28,000 horsepower at 30 feet. Single-running vertical shaft and adjustable blade propeller type is specified.

Additional contracts for the Fort Peck, Mont., project include: Motor driven reversing capstan for dredges to Silent Hoist Winch & Crane Co., Brooklyn, N. Y., $13,121; steel pipe elbows and valve for dredges to Black, Sivalls & Bryson Mfg. Co., Kansas City, Mo., $13,777; discharge pipe and connections to McClintic-Marshall Corp., Bethlehem, Pa., $67,255; trestle to Addison Miller Inc., St. Paul, $35,000; four hauling and hoist winches, Ellicott Machine Corp., Baltimore, $24,692; cranes, Curtis Mfg. Co., St. Louis, $19,112. Other awards were: Two crawler type excavating machines, Northwest Engineering Co., Chicago, $50,288; two anchor winches, Charles C. Stewart Machine Co., Birmingham, Ala., $17,764; one gas-power 25-ton locomotive, Root-Heath Co., Plymouth, O., $9790.

Garrett & Shafer Engineering Works, Seattle, received the award for construction of 7000 feet of 21-inch electrically welded pipe for the local seawall project, at $33,236. Half-inch plates will be used, the tonnage being 500.

It is reported that 2151 tons of reinforcing for the Coos bay bridge Portland, Oreg., have been awarded Concrete Engineering Co., Chicago, and 1000 tons for the Alsea span to Mercer Steel Co., Portland, Oreg.

We can help you PENETRATE your MARKET with

PAGE ALLEGHENY ALLOYS

Stainless Steel Wire

STEEL AND WIRE PAGE QUALITY PRODUCTS

The use of alloy steels increased 121.8% in 1933, 70% greater than the increase on all steel ingots. Manufacturers and fabricators everywhere are literally saving their business by meeting the public demand for products made to resist heat and rust and which add beauty.

Stainless Steel cannot be applied indiscriminately—problems of fabrication require specialized experience and engineering guidance.

Our Engineering Department, without cost to you, will assist you in specifications and price. Write today to

Branches: Atlanta — Chicago — New York
Pittsburgh — San Francisco

ACCO NRA

PAGE STEEL AND WIRE COMPANY MONESSEN PENNSYLVANIA

Formed Wire Parts · Welding Wire · Ornamental Parts
Cables, Wire Rope · Fabricated Products · Fencing

Steel in Europe

Foreign Steel Prices, Page 60

London—(*By Cable*)—British iron and steel markets are fairly active. Stewarts & Lloyds Ltd., Birmingham, has started an additional blast furnace. Operations are expanding in constructional, railroad and shipbuilding industries. Some increase is noted in exports of pig iron, and steel exports to the Argentine have been resumed. Continental billets are reappearing in the British market at 26 shillings a ton below British prices. Scotland reports scarcity in new business. Further rationalization of the tin plate industry is reported. It is reported that duties on steel products have been extended for five years from October, 1934.

Imports of steel into Great Britain in April were 125,324 tons, compared with 121,555 tons in March, a gain of 3769 tons. Steel exports in April were 165,164 tons, compared with 171,469 tons in March, a loss of 6305 tons.

Reports from the Continent are that export trade is quiet, but a slight expansion is noted in Germany.

Construction and Enterprise

New England

WALLINGFORD, CONN.—Borough, A. L. Pierce, superintendent of electric light department, 32 South Elm street, has retained Stone & Webster, 49 Federal street, Boston, to survey for rebuilding of the burned hydro-electric power plant.

BOSTON—Bureau of supplies and accounts, navy department, Washington, will open bids May 25, schedule 2519, on two electric shot welding equipments, for delivery at Boston.

BROCKTON, MASS. — Skild-Craft Machine Co. has been formed by Ashton Hamilton, 279 Prospect street, to manufacture machinery and machine parts.

FALMOUTH, MASS.—Town, N. M. Gediman, chairman electric light commission, has preliminary sketches for a municipal light plant by Metcalf & Eddy, 1300 Statler building, Boston, engineers.

NEWTON, MASS.—J. Dervan, formerly associated with American Tube Works, Somerville, Mass., has leased the former plant of the Shepherd Worsted Mills Co., 80 Bridge street, and will equip it for the manufacture of brass and copper tubing.

SOUTH BOSTON, MASS.—White Fuel Corp., 888 East First street, will ask bids soon for a mechanical coal-handling plant to cost $75,000. George P. Carver, 62 Dane street, Beverly, Mass., is architect.

CLAREMONT, N. H.—Manufacturing operations of Joy Bros. Inc., which have been handled by the Kelly Foundry & Machine Works, Mount Gilead, O., have been transferred to Claremont, N. H., as the result of a sale of the former company to the Sullivan Machinery Co., Chicago.

New York

BALDWINSVILLE, N. Y.—Plants of the Baldwinsville Spring Works and Penn Spring Works were damaged by fire at estimated loss of $55,000.

BROOKLYN, N. Y.—Bureau of supplies and accounts, navy, Washington, will open bids May 22, schedule 2500, for winches and spare parts, delivery Brooklyn, N. Y.

BROOKLYN, N. Y.—Caldo Engineering Co. Inc. has been formed by Gustave Zimmerman, 107 110th street, Richmond Hill, L. I., to manufacture oil burners and allied equipment.

BUFFALO—Artcraft Platers Inc. has been formed by Harold M. Goldstein, 499 Richmond avenue, and will establish a plant for electro-plating and metal polishing.

CANANDAIGUA, N. Y.—L. C. Reynolds, Geneva, N. Y., engineer, has sketches for a proposed electric light and power plant and distributing system, to cost about $260,000.

GENEVA, N. Y.—City will open bids June 7 for construction of sewage disposal system to cost $300,000.

LOCKPORT, N. Y.—City is applying for federal loan of $60,000 for construction of garbage incinerator.

NEW YORK—New York Brass & Copper Co. Inc. has been organized with $250,000 capital by Charles Goldenberg, 261 Broadway, New York, to deal in metals.

NEW YORK—West Side Supply Co. Inc. has been formed by H. Schantz, 274 Madison avenue, New York, to deal in sheet metal and galvanized iron products.

NEW YORK—American Consolidated Tin Mines Corp., 120 Liberty street, will ask bids soon for a tin ore milling plant for its development near Lincolnton, N. C., including machine shop and powerhouse, mining, hoisting and conveying equipment. U. S. James, 35 Runyon street, Newark, N. J., is metallurgical engineer.

NIAGARA FALLS, N. Y.—Union Carbide & Carbon Co. will build a 2-story addition of 170 feet front and two 40 x 60-foot wings, for its metallurgical division, on Forty-seventh street. General contract has been awarded to Laur & Mack, 1400 College avenue, at about $28,500.

PULASKI, N. Y.—Harnden Machine Co. Inc. has been organized by Sargent & Sargent, Sandy Creek, N. Y., to manufacture mechanical devices.

Pennsylvania

DONORA, PA.—The Monongahela river dock of the American Steel & Wire Co. was destroyed by fire, including a barge and pile driver.

HARRISBURG, PA.—Secretary of property and supplies, Capitol building, Harrisburg, Pa., will receive bids May 29 for an air conditioning system for senate and house chambers, state capitol building, Harrisburg, consisting of refrigerating equipment, heaters and all necessary auxiliary equipment.

HARRISBURG, PA.—Department of property and supplies is planning filtration plant improvements at Polk state school, Polk, Pa., including installation of rate controllers, centrifugal pumps, motor drive, water motors and dry feed chemical machine. J. N. Chester, Clark building, Pittsburgh, is engineer.

PHILADELPHIA — Linde Air Products Co., Eighteenth and Cambria streets, has awarded contract to William Steele & Sons Co., Fifteenth and Cherry streets, for alterations and additions to its plant.

PHILADELPHIA—Swift & Co., William Robinson, Ninth and Girard avenues, are having plans prepared for a 2-story packing plant addition, 50 x 100 feet. A. E. Bump, 25 Fanueil Hall square, Boston, is engineer.

PHILADELPHIA—Charles Bowman, southwest corner Germantown avenue and Willow Grove avenue, has booked an order for erecting a tool house at 7312 Elbow lane, Philadelphia, for Wilson S. Yerger. Robert R. McGoodwin, Architects' building, Philadelphia, is architect.

Ohio

ALLIANCE, O.—Buckeye Jack Mfg. Inc., H. E. Blasingham, president, has bought the assets of Buckeye Jack Mfg. Co., Alliance, O. in receivership, and will continue its production of automotive and railroad jacks. A new type of jack is being developed.

CLEVELAND—Brown Fence & Wire Co., 6532 Juniata avenue, Cleveland, has leased warehouse with railroad siding and handling facilities at Twenty-eighth street and Allegheny Valley railroad, Pittsburgh, within the Pittsburgh switching district, where galvanized roofing will be produced.

CLEVELAND—Ackerman Rubber & Plastic Molding Co., newly organized, has leased former plant of Stearns Conveyor Co., East 200th street and New York Central tracks, 12,000 square feet of floor space on 5½ acre site. Will spend $50,000 on new equipment for production of rubber specialties. F. J. Ackerman, president and treasurer.

DAYTON, O.—Dayton Casting Co. recently was damaged by fire to the extent of $18,000.

MARIETTA, O.—Extension of the option on the Hudson steel mill here has been granted by W. F. Robertson, Cincinnati. Cincinnati interests plan to form a company to operate the plant.

MT. VERNON, O.—Pittsburgh Plate Glass Co.'s window glass plant will resume operation in August. Engineers

are checking to determine what equipment and machinery will be needed to replace the pieces moved out when the plant was closed in December, 1931. James Watt is superintendent.

ORRVILLE, O.—K. & F. Brass Foundry, idle for the past two years, has been leased to Robert R. Cairnie, formerly foreman of the Ohio Injector Co., Wadsworth, O.

ORRVILLE, O.—Orrville Body Co., John LeChot, owner, has taken space in the office and plant of the Sanderson Cyclone Drill Co., following the recent $30,000 fire which destroyed its building and equipment. Most of the machinery will have to be replaced.

Michigan

ANN ARBOR, MICH.—University of Michigan is planning a $25,000 addition to its engineering building.

ANN ARBOR, MICH.—Ann Arbor Sheet Metal Co. is planning to erect a 2-story storage house.

BUCHANAN, MICH.—D. S. Larson & Co. has been incorporated with 1000 shares of no par value by Daniel S. Larson, Buchanan, to deal in electric plating processes.

DEARBORN, MICH.—Stout Motor Car Corp. has been incorporated by William B. Stout, Stanley Knauss and Glenn Hopkin, to manufacture motor cars.

DEARBORN, MICH.—Peter Eddy, with a bid of $26,455, was low for the power plant addition to be erected at the federal prison at Milan, Mich. Woodworth & Loree, Ann Arbor, Mich., are architects.

DETROIT—East Side Gear & Tool Co., 2981 Charlevoix, is planning to construct a factory building on Connors avenue.

DETROIT—Majestic Pattern Works Inc. has been formed to deal in patterns by Gerhardt E. Bauer, 4457 Kensington road.

DETROIT—L. & W. Tool & Die Co. Inc. has been organized by Edwin P. Lloyd, 228 Farnsworth avenue, to manufacture tools.

DETROIT—Lowry Mfg. Co., 2358 National Bank building, has been incorporated with $25,000 capital to manufacture machines, by LeRoy Lowry, 2572 Helen avenue.

DETROIT—Standard Steel Treating Co., 3467 Lovett avenue, has been incorporated to engage in heat treating, by Stephen Safko, 2414 South Electric avenue.

DETROIT—Domestic Air Conditioning Co., 14021 Brush street, has been incorporated by August M. Kolstad, 17371 Kentfield avenue, to deal in air conditioning equipment.

DETROIT—Paul Tilds, 1346 Broadway, architect, is preparing plans for a 6-story addition to the brewing plant of the Ekhardt & Becker Brewing Co., Detroit.

DETROIT—Corrugated Lock Washer Co. Inc., 4734 Bellevue avenue, has been incorporated with $50,000 capital by Emanuel J. Harris, 1612 Union Guardian building, to manufacture washers.

DETROIT—Goebel Brewing Co., Rivard and Maple streets, has placed an order with the Michael Yundt Co., Waukesha, Wis., for a new bottling unit. Addition of the new unit will give the brewery a maximum capacity of 14,000 cases a day.

DETROIT—Regal Brewing Co., represented by Peter Drexelius, 2262 First National Bank building, is considering the erection of a new brewery, or alterations on an old plant to convert it into a brewery.

DETROIT—Independent Brewry Co. has let contract to Banbrook-Gowan Co., 4829 Woodward avenue, for erection of model brewery of 125,000-barrel capacity. As construction proceeds, tanks and vats will be installed. (Noted May 14.)

DETROIT—Voigt Brewery Co., Ten Mile road and Grand Trunk railroad, is entering the brewing business again. The brewery will have an an initial capacity of 100,000 barrels annually. Construction and equipment work is under direction of G. A. Mueller, 1346 Broadway, Detroit, architect and engineer.

FLINT, MICH.—General Foundry & Mfg. Co. has been incorporated by the General Foundry & Machine Co., Hemphill road, to manufacture automotive parts.

GRAND LEDGE, MICH.—City is considering erection of a new municipal light plant. Hamilton & Weeber, Grand Rapids, Mich., are preparing the plans.

MASON, MICH.—Wilson Packing Co. will soon award contracts for a new packing plant, 90 x 166 feet, to replace the one destroyed by fire in November, 1933, at a loss of $75,000.

MT. CLEMENS, MICH.——Mt. Clemens Pottery Co. is planning to build an addition to its plant, 50 x 947 feet, at a cost of $35,000.

MUSKEGON HEIGHTS, MICH.—Campbell, Wyant & Cannon Foundry Co. has opened its No. 1 plant on Sanford street, closed since July, 1930. Repairs and improvements to plant and machinery have been made.

OVID, MICH.—R. W. Lewis and Max Lewis are reported to be organizing an oil refining company to be located at Elsie, Mich. They expect to complete their stock sale and begin building operations within a few weeks.

YPSILANTI, MICH.—United Stove Co. is building an addition to its plant that will provide 5270 square feet of floor space.

Indiana

RUSHVILLE, IND.—Stark Mfg. Co. Inc. has been formed by John and James Stark, both of Rushville, to manufacture electrical devices and supplies.

Illinois

CARY, ILL.—Minerva Corp. has been incorporated by Charles C. Huffman, Robert Goslin and William J. Andrews, to manufacture carbonating and bottling machinery, equipment and devices. Correspondent: William J. Andrews, 105 West Madison street, Chicago.

CHICAGO—Associated Heater Parts Co., 3102 Wentworth avenue, has been incorporated by John P. Kaufman, Conrad W. Kaufman and John P. Kaufman Jr. to deal in sheet metal products. Correspondent: J. P. Kaufman, 2425 Montrose avenue.

CHICAGO—Chicago Porcelain Enameling Co., 2028 North Major avenue, has been incorporated by R. I. Wells, C. F. Wells and M. K. Wells, to manufacture and process iron, steel, copper, brass and other metals. Correspondent, Joseph & Burr, First National Bank building, 33 South Clark street.

CHICAGO—T. W. McNeill Engineering Equipment Co., 4057 West Van Buren street, has been incorporated by T. W. McNeill, Elizabeth McNeill and W. T. McNeill, to manufacture and deal in measuring gages. Correspondent, Litzinger, Healy, Reid & Bye, Suite 1121, 111 West Washington street.

Alabama

AUBURN, ALA.— Department of agriculture has low bid of $29,710 from J. M. Raymond Construction Co., Jacksonville, Ala., for construction of farm tillage machinery laboratory.

Delaware

WILMINGTON, DEL.—Walter Carlson, DuPont building, architect, is ready to receive bids for construction of laundry building, 75 x 90 feet, for the Associated Wilmington Laundries, 417 West Second street, Wilmington, Del.

District of Columbia

WASHINGTON—Commanding officer, quartermaster depot, Twentieth and C streets, northwest, will receive bids May 25, circular 950-34-124, for gasoline-electric generator sets, 5 kilowatt capacity, 115 volts, direct current.

WASHINGTON — Quartermaster, Navy building, will receive bids May 28, schedule 531, on duplex electric driven pump and receiver; turbine driven centrifugal boiler feed pump, and electric driven boiler feed pump.

Georgia

AUGUSTA, GA. — Lombard Iron Works & Supply Co. has leased the plant of the Textile Machinery Corp., Spartanburg, S. C., for the manufacture of textile castings.

COLUMBUS, GA.—Board of water commissioners, C. F. Jordan, superintendent, will receive bids June 1 for waterworks extension, to cost about $35,000.

Kentucky

COVINGTON, KY.—New England Distilling Co., 115 Pike street, is planning storage and distributing building to cost $25,000, including equipment. Albert E. Foster, City hall, is architect. (Noted April 16.)

LOUISVILLE, KY.—Louisville Distillery Co. has been incorporated with capital of $10,000 by Milton R. Frank and Arthur S. Storm.

Louisiana

NEW ORLEANS—United States engineer office, Henry Hutchings Jr., major, corps of engineers, district engineer, first district, 837 Gravier street, will open bids May 25 on the following equipment: One each, 19-inch heavy duty, geared head, quick change, engine lathe, with motor; light duty, 14-inch, quick change engine lathe, with motor; 24-inch manufacturing shaper, with motor; pipe threader, capacity ⅛- to 8 inches, with motor; geared machine, sliding head, 25-inch, drill press, with motor; double duty bench drill press, with motor; power hack saw, 6 x 6, with motor; heavy duty tool post

grinder, with motor; grinder and buffer, with motor; combination woodworking and metal cutting machine, with motor; blacksmith forge and blower, with motor; 60-ton hand operated, portable, hydraulic press; planer and jointer, with motor; gasoline pump with underground tank; and eight electric heater and blower units.

Maryland

BALTIMORE—Frainie Bros., 19 West Franklin street, have contract for one-story boiler house at southeast corner of Gay and Lanvale streets.

BALTIMORE — Hunter-Gwynnbrook Distillery Corp. has leased a two-story building at 642-46 West Pratt street for a rectifying, blending and bottling plant. Talbot O. Freeman, 49 Wall street, New York, is vice president in charge of operations here.

WESTMINSTER, MD. — Ligon & Ligon, 3310 Ridgewood avenue, Baltimore, have been awarded contract at $198,820 for sewer and disposal plant. J. B. Ferguson, Hagerstown, Md., is engineer.

Mississippi

ELLISVILLE, MISS.—Homer and Monroe Townly, recently granted a franchise, will erect a power plant.

HATTIESBURG, MISS.—E. C. Hearon & Sons, Carter building, Hattiesburg, Miss., architect, has been selected by the board of trustees of institutions of higher learning, Jackson, Miss., to prepare plans for a heating and power plant to contain two 250-horsepower water tube high pressure boilers with necessary steel breechings, and additional feed water and vacuum pumps, at the state teachers college.

MAGNOLIA, MISS.—City will open bids May 28 for water supply and pumping station improvements, including equipment, machinery, deep well motor-driven turbine pump, pumping station building with steel derrick, and 60-horsepower 4-cylinder diesel oil engine complete with all accessories. Henry A. Mentz & Co. Inc., Hammond, La., is engineer.

OXFORD, MISS.—Board of trustees of institutions of higher learning, Jackson, Miss., will remodel power plant and install new equipment, at University of Mississippi, including water tube boilers with mechanical stokers, feed water pump and two vacuum pumps.

North Carolina

CHARLOTTE, N. C.—Huttig Sash & Door Co., 1200 South Vandeventer, St. Louis, has leased a building at 200 East Bland street here and will establish a branch and will also construct an addition.

BURLINGTON, N. C.—Armco Finishing Co., Britt M. Armfield, is considering rehabilitating a building to house the finishing plant and will install machinery. Henry Diechman is superintendent.

WILSON, N. C.—Hackney Industries Inc. has been incorporated with $50,000 capital by George Hackney Jr. and H. J. Hackney.

South Carolina

GASTONIA, N. C.—Gaston Electrox Plating Co. has been formed with capital of $100,000 by Alfred S. Robinson and A. J. Roach.

GREENWOOD, S. C.—Emerald Hosiery Mills Inc., A. R. Headen, secretary, is planning to install 100 machines.

GREENWOOD, S. C.—Finance board for Greenwood county, E. L. Brooks, supervisor and chairman, and Daniel T. Duncan, engineer, are working on plans for development of Buzzard's Roost power project with PWA. Estimated cost is $2,650,000.

THOMASVILLE, N. C.—City, James E. Lambeth, mayor, will receive bids May 25 for an elevated steel water tank on steel tower for waterworks system.

Tennessee

McEWEN, TENN.—City, J. C. Parks, mayor, will receive bids May 22 for constructing water supply system. PWA loan and grant has been approved. Freeland Roberts & Co., Independent Life building, Nashville, Tenn., are engineers.

West Virginia

DANVILLE, W. VA.—Town is planning to construct waterworks. Charles E Krebs Inc., Charleston, W. Va., is the town's engineer.

WEST UNION, W. VA.—City is planning to drill two wells and install 25-gallon-per-minute turbine pumps and also to erect a pump house and install 70-gallon-per-minute piston pumps. Estimated cost is $13,000. Bernard G. Sampson Co., Fairmont, W. Va., is engineer.

Virginia

BUCHANAN, VA.—Engineering division of PWA has approved application of $48,000 for improvements to waterworks.

LANGLEY FIELD, VA.—Constructing quartermaster will open bids May 28, proposal 6174-34-44, for 20 range boilers, 20 range boiler stands and 21 domestic heaters.

NORFOLK, VA.—Bureau of supplies and accounts, navy department, Washington, will receive bids May 25, schedule 2497, on motor-driven multiple spindle, horizontal boring mill.

NORFOLK, VA.—Bureau of supplies and accounts, navy, Washington, will receive bids May 22, schedule 2485, on one double-end horizontal drilling machine, complete with electrical drive; schedule 2495, one motor-driven toolmakers' precision lathe; May 25, schedule 2497, one motor-driven multiple spindle horizontal boring mill; all for delivery at Norfolk, Va.

RICHMOND, VA.—Old Nick Williams Inc. has been incorporated with capital of $100,000 by Z. Vance Williams, Lewisville, N. C., and E. A. Williams, Winston-Salem, N. C., to operate a distillery.

Missouri

ST. JOSEPH, MO.—M. K. Goetz Brewing Co., Sixth and Albemarle

GOOD USED EQUIPMENT

For

DIE CASTING
FORGING INDUSTRY
MACHINE SHOPS
POWER PLANTS
ROLLING MILLS
STAMPING
and
ALLIED INDUSTRIES
STRUCTURAL,
BOILER
and
TANK INDUSTRY

BENDING ROLL—25′ 6″ NILES-BEMENT-POND Plate. Pyr. Type. Arr. for MD. Top roll 24-7/8″ dia. Bottom rolls 18″ dia. Cap. 1″ plate. Drop end housing.

BRAKE—12′ 6″ LOY & NAWRATH Press Type. Cap. 1/4″. Tie rod frame. New in 1927.

CRANE—5-T. SHEPARD Overhead Elec. Trav., 52′ 4″ span, 230 v. DC. Also equipped for bucket & magnet operation. 350 feet of Double "A" Frame Runway.

FURNACE—500-lb. MOORE Rapid 'Lectromelt for electric steel melting, 3 phase with complete electrical equipment including Transformer, 2200 to 120 volt AC.

MAGNET—45″ ELECTRIC CONTROLLER MFG. CO., 230 V. DC.

MOTORS—(3) 200 HP WESTINGHOUSE Type CW, 3 ph. 60 cy. 440 v. Slip Ring, 900 RPM, complete with pulleys, drum controllers and resistance.

PLANER—96″ x 96″ x 14′ POND Four Head, Heavy Duty, 50 HP Motor Drive.

PRESSES—No. 12 BLISS Straight Side, Double Crank, Double Geared, Single Action. 14″ stroke. Bed area 52 x 84″. Shaft dia. 12″ at bearings; 13″ at pins. Arranged for MD and motor adjustment. Wgt. 200,000 lbs.
No. 6-1/2 BLISS Straight Side, Double Crank with spring counterbalance. Belt Drive. 54″ between housings. 8″ stroke.

SHAPER—32″ COLUMBIA High Duty. Quick Change Speedbox. Arranged for direct connected constant speed motor drive.

SHEAR—No. 10 BUFFALO for bars and shapes. Cap. up to 3-7/8″ rounds and corresponding duty in shapes. Direct connected AC MD with motor.

WHEEL PRESS—300-Ton CHAMBERSBURG Hydraulic. 54″ between parallel bars. Driven by 7-1/2 HP motor.

In addition to the above, we have available a wide variety of good equipment in various types and sizes.

Manufacturing RITTERBUSH & COMPANY, INC. Equipment
30 CHURCH ST.
NEW YORK CITY

Chilled Rolls, and Rolling Mill Machinery

Air Furnace and Gray Iron CASTINGS

Roll Lathes, Sheet and Tin Mill Shears of all kinds; Steam Doublers; Stretcher Levelers and Rolling Mill Machinery built to specification. We shall be glad to figure on your requirements.

The New "RED CIRCLE" Heat Treated Chilled Rolls for SHEET and TIN MILLS

Hyde Park Foundry & Machine Co.
HYDE PARK, PA., U. S. A.
(Pittsburgh District)

NIAGARA BRAND FERRO-ALLOYS

FERRO-SILICON
ALL GRADES

FERRO-CHROMIUM
HIGH CARBON

FERRO-CHROMIUM
LOW CARBON

SILICO-MANGANESE

FERRO-MANGANESE

Always
DEPENDABLE, UNIFORM, SUPERIOR

PITTSBURGH METALLURGICAL COMPANY, INCORPORATED
NIAGARA FALLS, NEW YORK

Producer Gas Systems

WE GUARANTEE RESULTS

Using Bituminous and Anthracite Coal, Raw and Scrubbed Gas, for Displacing Oil, City and Natural Gas Coal and Coke in furnaces of all descriptions.

Flinn & Dreffein Co.
308 W. Washington St. Chicago, Ill.

Use RODINE For Pickling

and Save at Least 30c Per Ton

AMERICAN CHEMICAL PAINT CO.
Ambler, Pa.

SC&H Furnaces are made for annealing, case hardening, carburizing, forging, cyaniding, lead hardening & oil tempering.

STRONG CARLISLE & HAMMOND
1400 W. 3rd St., Cleveland, O.

SC&H Furnaces are built in all sizes of Oven, Pot, Continuous, and Special Types for Electric, Oil or Gas application.

ONE PIECE—NON-SLIP—MAXIMUM VENTILATION—EASILY PAINTED—NO RATTLES

BLAW-KNOX CO. PITTSBURGH, PA.

PERIN ENGINEERING CO., Inc.

CONSULTING ENGINEERS

Investigations, Reports, Development of Raw Materials, Ore Sintering, Coke Ovens, Blast Furnaces, Open Hearth and Electric Steel Plants, Rolling Mills, Power Plants, Cement Plants

535 Fifth Ave. NEW YORK
Cable Address PERINESTEP

CERTIFIED

MALLEABLE IRON CASTINGS

Detachable Sprocket Chain
Riveted Sprocket Chain
Malleable Washers, etc.

PEORIA MALLEABLE CASTINGS CO.
FT. ALEXANDER ST. PEORIA, ILLINOIS

SMALL ELECTRIC STEEL CASTINGS
(Capacity 500 Tons per Month)

WEST STEEL CASTING CO.
CLEVELAND OHIO, U. S. A.

"He Profits Most Who Serves Best"

Better Steel Castings

streets, will soon call for bids for a boiler house and machine shop, in addition to the erection of a plant. Estimated cost is $450,000. George L. Lehle, 111 West Washington street, Chicago, is architect and engineer. (Noted April 16.)

ST. LOUIS—Werner Process Corp. has been incorporated by Arthur M. Werner and Harry Manheimer, 5616 Pershing, to operate a distillery.

ST. LOUIS—Heinie Boiler Co. property, in receivership, will be sold by court order on mortgage of $350,000 to secure bonds. Probably will be bought by bondholders' committee and company reorganized.

Arkansas

COTTER, ARK.—City, Lowell Jolley, clerk, is planning to spend $55,000 for pumping plant and storage reservoir.

JONESBORO, ARK.—Jonesboro A. & M. college, V. C. Kays, president, has PWA funds of $450,000 for constructing model training school and combination power plant and engineering building.

LITTLE ROCK, ARK.—Maj. E. R. Payne, United States property and disbursing officer, has awarded contract to Ben Hogan, Little Rock, Ark., for construction of pump house and reservoir, and installation of pumping unit.

YELLVILLE, ARK.—General Mining Corp., R. L. Robinson, secretary-treasurer, Wilmington, Del., recently incorporated, has leased 1048 acres of approved zinc and lead properties in Ozark district near Yellville and will install modern milling machinery. It also plans to install and operate its own electrolytic smelting plant in this field. J. H. Hand, vice president and general manager at mines, and Charles H. LeVasseur, consulting engineer, are both at Yellville.

Oklahoma

ADA, OKLA.—H. H. Hanenkratt and H. D. Barndollar are planning to erect a crushing and screening plant of 400 tons daily capacity.

FAIRFAX, OKLA.—City has voted bonds for waterworks. V. V. Long & Co., Colcord building, Oklahoma City, Okla., is engineer.

TULSA, OKLA.—W. F. Bleecker, North Rockford street and Frisco railroad, has leased building space, 50 x 120 feet, and has installed equipment for manufacture of time bombs for oil well shooting.

Texas

AUSTIN, TEX.—City will vote in June on $750,000 bonds for municipal improvements.

DALLAS, TEX.—R. B. George Machinery Co., R. B. George, president, 1135 South Lamar street, is enlarging the building at 1217 South Lamar street for the International Harvester Co., lessee. J. A. Pitzinger, 6210 Lakeshore drive, is architect. Estimated cost is $20,000.

GOOSE CREEK, TEX.—City will soon vote on $50,000 bonds for power plant, C. R. Myers, mayor.

HOUSTON, TEX.—City will vote at special election on $2,500,000 bond issue for municipal water system.

MINERAL WELLS, TEX.—Purity Products Corp., H. C. Christopher, secretary, is completing plans for manufacture of water crystals and by-products. Contract for a plant 36 x 130 feet has been awarded to J. F. Stover, 615 Southeast Sixth street, Mineral Wells. Evaporation system, refrigeration and drying equipment and pumping equipment for 15 water wells will be installed. T. B. Imboden, 2 Simmons apartment, Mineral Wells, constructing engineer. W. C. Agee, Mineral Wells, architect.

Wisconsin

MILWAUKEE—Milwaukee Malleable & Gray Iron Works, 2773 South Twenty-ninth street, has resumed production in the idle half of its malleable shop. Alterations have also been made in the gray iron department to accommodate an additional cupola and sand blasting equipment.

Nevada

LAS VEGAS, NEV.—Coca-Cola Bottling Works is building a new bottling and cold storage plant here.

MINA, NEV.—Nevada-Massachusetts Co., Ott F. Heizer, general manager, is now operating its 75-ton mill near here on about 225 tons of tungsten ore produced daily at Mill City, Nev.

NIGHTINGALE, NEV. — Tungsten Production Co., owner of tungsten property here, has changed its name to Gold, Silver & Tungsten Inc., and is considering reopening the property.

Pacific Coast

GALT, CALIF.—Sego Milk Products Co. is constructing a powdered milk plant here.

LOS ANGELES—H. H. Walker Inc. and Fritz Ziebarth, Security building, electrical contractors, will construct a transmission line from Great Falls to Fort Peck dam, Mont., which will be of woodpole and cross-arm construction and will include 62 tons of pole line hardware, 34 tons of insulator hardware, 31 tons of cast iron anchors, 30 tons of guy wire and 15 tons of rope wire.

SAN DIEGO, CALIF.—Campbell Machine Co. has booked an order for a $90,000 tuna clipper from Louis Castagnola and Laurie Massa, San Diego fishermen. This boat will be powered with a 410-horsepower 7-cylinded diesel engine and two diesel electric auxiliary engines. Equipment will include modern refrigerating plant.

STOCKTON, CALIF. — Hermovita Corp. has obtained a permit to build a $300,000 distillery on Roberts island, near here.

PORTLAND, OREG.—Western Wax Paper Co. has asked bids from selected contractors for a proposed $20,000 addition, 100 x 150 feet.

PULLMAN, WASH.—A. E. Drucker, dean of Washington state college, announces inauguration of a research program with reference to new industries and development to follow completion of the Coulee power project. A survey will be made of the possibilities of opening up a large magnesite deposit in northeast Washington.

SEATTLE—Henry Bittman, Securities building, architect, has been authorized to prepare plans for a five-story reinforced brewing plant to cost $175,000, for the Silver Foam Brewing Co.

New Trade Publications

COUPLINGS—Bulletin No. 48 has been issued by John Waldron Corp., New Brunswick, N. J., describing its torque ring couplings, with full description and ample illustrations.

MACHINE TOOLS—Wagner Electric Corp., St. Louis, in bulletin 174, part 7, shows a number of machine tools of various sizes and uses, all operated by this company's motors.

CONVERTERS—Louis Allis Co., Milwaukee, has issued two bulletins on its converters. Bulletin No. 509A illustrates and describes construction, operation and uses of various types of frequency converters. Bulletin No. 502B is devoted to inverted rotary converters.

COMPRESSORS—Worthington Pump & Machinery Corp., Harrison, N. J., describes in a bulletin, L-620-S3A, its type VA-2 air compressor units for garages, repair shops and service stations, with full automatic start and stop control. It is fully illustrated.

PYROMETERS—An individual pyrometer for every heat machine is offered in a current bulletin by Russell Electric Co., 340 West Huron street, Chicago. The bulletin indicates application of these pyrometers by manufacturers of machines using heat, where exact control is needed.

TRAMRAIL—A comprehensive diagram, a cross section of a large industrial works, equipped with every form of tramrail handling equipment, has been prepared by Cleveland Tramrail division of Cleveland Crane & Engineering Co., Wickliffe, O. The purpose is to show the wide adaptability of its product.

HEATING UNITS—Edwin L. Wiegand Co., Pittsburgh, in its catalog No. 34 presents its various types of heaters to apply electric heat at the point needed. A series of installation diagrams is included and various data of value to the user of electric heat. The catalog covers part of the company's line of heaters, applicable for use up to 1000 degrees Fahr.

OIL CIRCUIT BREAKER—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in catalog No. 33-200 covers its complete line of oil circuit breakers up to 50,000 kilovolt-amperes. It includes tables giving the proper type of breaker, indoor, outdoor or subway, for any kilovolt-amperage needed and a table of contents with references to specific sections for each type of breaker.

PUMPS—Modern boiler feed pumps for pressure up to 600 pounds are presented in Bulletin No. 2078 by the Ingersoll-Rand Co., Phillipsburg, N. J. A feature of this pump is the hydraulic balance obtained by placing an equal number of impellers back to back, resulting in elimination of high-pressure stuffing boxes. The casing is split horizontally, allowing the entire rotor to be removed without disturbing bearing adjustment or disconnecting any part of the piping.

THE BURDEN IRON COMPANY
TROY, N. Y.

Manufacturers for More Than a Century of High Grade Wrought Iron Products

Staybolt Iron—both Solid and Hollow Rolled
Engine Bolt Iron and Chain Iron
Iron Rivets and Rivet Iron
"B. B. Burden Best" and "H. B. & S." Iron

General Office: Troy, N. Y.
Branch Office: 310 So. Michigan Ave., Chicago.

HANNA PIG IRON

BRANDS:
Buffalo—Detroit—Susquehanna
GRADES:
Foundry—Malleable
Silvery—Ferro-Silicon

The HANNA FURNACE CORP.
MERCHANT PIG IRON DIVISION
OF NATIONAL STEEL CORP.
Buffalo, New York Detroit, Mich.
New York Philadelphia Boston

BROOKE PIG IRON
E. & G. BROOKE IRON CO.
BIRDSBORO, PENNA.
MFGRS OF HIGH GRADE
FOUNDRY
BASIC
GREY FORGE
MALLEABLE
BESSEMER
LOW PHOS.

Chronology of Iron and Steel—
332 pages
Price Postpaid $4.15 (20s.6d.)
Important events in the development of iron and steel since pre-historic times have been compiled by Stephen L. Goodale, Ph. B., E. M., A. M., and edited by J. Ramsey Speer, S. B. These developments are recorded and indexed so that reference to any subject is readily available.
THE PENTON PUBLISHING CO.
Book Department
1213 W. 3rd St. Cleveland, O. 519-S.F.

THE OHIO STRUCTURAL STEEL CO.
NEWTON FALLS, O.
ENGINEERS, FABRICATORS & ERECTORS OF STEEL CONSTRUCTION

BELMONT IRON WORKS
PHILADELPHIA NEW YORK EDDYSTONE
Engineers - Contractors - Exporters
STRUCTURAL STEEL — BUILDINGS & BRIDGES
RIVETED — ARC WELDED
BELMONT INTERLOCKING CHANNEL FLOOR
Write for Catalogue
Main Office—Phila, Pa. New York Office—44 Whitehall St.

The Shenango Furnace Company
Lake Superior Iron Ores
Bessemer, Non-Bessemer, Aluminiferous
Shenango Pig Iron
Bessemer, Basic, Malleable, Foundry
Coal and Coke
THE S F CO.
OLIVER BLDG., PITTSBURGH UNION TRUST BLDG., CLEVELAND

STAINLESS STEEL
ALSO
HIGH SPEED and CARBON TOOL STEEL
LATROBE ELECTRIC STEEL CO. LATROBE, Pa.

RYERSON-STEEL
Immediate shipment of all steel and allied products including bars, structurals, sheets, plates, special alloy, and tool steels, Allegheny metal, babbitt, boiler tubes and fittings, welding rod and equipment, metal working tools, etc. Write for the Ryerson Journal and Stock List.
Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

SCREENS of Perforated Metal
The Harrington & King PERFORATING Co.
5634 Fillmore St., Chicago, Ill.
New York Office—114 Liberty St.

SAVE WITH STEEL
WEIRTON
PRODUCERS OF

Pig Iron; Open Hearth Steel; Billets—Slabs—Sheet Bars—Skelp; Angles, Beams and Channels; Round, Square and Flat Bars; Rails—Steel Plates—Tie Plates—Track Spikes—Splice Bars; Reinforcing Bars; Coke Tin Plate; Kanners Special Cokes—Best Cokes—Charcoals; Lacquered Tinplate; Tin Mill Black Plate (All Finishes); Lacquered Black Plate; Copper Bearing Terne Plate; Hot and Cold Rolled Strip Steel and Strip Steel Sheets; High Finish Sheets; Long Terne Sheets (Common and Special Finishes); Galvanized, Black and Blue Annealed Sheets; Corrugated Sheets, V Crimp Sheets, Roll Roofing; Single Pickled, Full Finished and Auto Body Sheets; Coke—Tar—Benzol—Toluol—Ammonium Sulphate.
WEIRTON STEEL CO.
WEIRTON. W. VA.
Division of National Steel Corporation
Sales Offices in All Principal Cities